

27 April 2012

Jennifer J. Johnson
Secretary
Board of Governors of the Federal Reserve System
20th Street and Constitution Avenue, NW
Washington, DC 20551

Re: Docket No. 1438 and RIN 7100-AD-86

Dear Ms. Johnson:

The World Gold Council respectfully submits its comments to the Board of Governors of the Federal Reserve System (the Board) on the proposed rule “Enhanced Prudential Standards and Early Remediation Requirements for Covered Companies”, which are contained in the attached document. The World Gold Council is supportive of the international regulatory effort to introduce liquidity buffers into the global banking system, over and above the existing capital adequacy requirements. We submit that gold should specifically be included in the final rule’s definition of highly liquid assets, as gold meets the criteria presented in the proposed rule and global criteria put forward by the Basel Committee on Banking Supervision.

Gold fulfils each of the criteria set out in section 252.57 of the proposed rule and exhibits additional characteristics that will enhance the stability of the liquidity buffers. The World Gold Council highlights the following attributes of gold in addressing the criteria of section 252.57:

- 1 Governments already benefit from holding gold in their official reserves, commercial banks should be allowed the same benefit
- 2 Gold is a unique asset, different from commodities and has no credit risk
- 3 Gold provides unparalleled diversification as it is not correlated to stocks, bonds, commodities, and specifically not correlated to the other assets currently being considered for liquidity buffers
- 4 Global banking regulations already recognise gold’s quality, and define it as being a “zero-risk weighted” asset with a volatility more consistent with foreign exchange than other commodities
- 5 The gold market is as large and liquid as sovereign debt markets in the US, Japan, and Europe
- 6 Gold has a long history as a flight-to-quality asset, it is negatively correlated to risky assets during financial stress, and a history of performing well during global liquidity events
- 7 The addition of gold to the liquidity buffers will alleviate the challenges associated with the growing scarcity of other “safe assets”.¹

Furthermore, the World Gold Council has conducted extensive research on the effect of adding gold to bank liquidity buffers and finds that by including gold as an eligible asset, commercial banks would reduce the volatility and value-at-risk of their buffers. Our analysis also finds that a liquidity buffer with gold outperformed one without gold during the most extreme liquidity stress events over the past 10 years. Finally, we demonstrate that gold, on average, provided positive returns during credit events experienced by Bank Holding Companies and on days when bank equity indices declined significantly.

The World Gold Council welcomes the proposed rule's requirement that the pool of assets included in the liquidity buffers be sufficiently diversified as this will help mitigate the risk associated with a shock to any one asset class. As gold is not correlated with other liquid assets gold would provide additional diversity to the typical liquidity buffer assets.

We would be pleased to answer any questions you may have regarding this submission. Thank you for your consideration of our views.

Sincerely,



Aram Shishmanian
CEO, World Gold Council

This letter is endorsed by:
The London Bullion Market Association

Outline

Response to Question 14 on why gold should be listed as a highly liquid asset in the proposed *Enhanced Prudential Standards and Early Remediation Requirements for Covered Companies*.

How gold meets the three criteria set out in Section 252.57

- | | | |
|-----|---|---|
| i | “Has low credit risk and low market risk” | 4 |
| ii | “Is traded in an active secondary two-way market that has observable market prices, committed market makers, a large number of participants, and a high trading volume” | 5 |
| iii | “Is a type of asset that investors have historically purchased in periods of financial market distress during which liquidity is impaired (flight to quality)” | 7 |

Other criteria that the Board should consider for determining liquid assets

9

Charts 11

Appendix: WGC Case study: Examining the impact of including gold in the LCR 18

Question 14: “What, if any, other assets should be specifically listed in the definition of highly liquid assets? Why should these other assets be included (that is, describe how the asset is easily and immediately convertible for cash with little or no loss in value during liquidity stress events)?”

i “Has low credit risk and low market risk”

Credit risk

Gold has no credit risk. Gold is no one or country’s liability. A covered company holding gold can store it with a custodian on an “allocated” basis, meaning the metal is physically segregated in the vault. The clients’ holdings are identified in a weight list of bars showing the unique bar number, gross weight, the assay or fineness of each bar and its fine weight. The client has full title to the metal in the account. Most physical settlement of gold occurs through the London market where many commercial banks custody their gold with the Bank of England. Physical settlement of gold also takes place around the world in major financial hubs like New York.

Meanwhile, the credit risks associated with government and corporates’ balance sheets have increased sharply due to the ongoing deterioration in public finances and the global economy. Further downgrades of US debt by the rating agencies are likely if the US administration fails to develop and implement a credible debt reduction plan. In this scenario, even the US Treasury market could experience liquidity strains.

Fiat money also has a form of “credit” risk as it represents a direct liability of a government. Expansionary monetary policies along with increased fiscal burdens risk fuelling inflation once the economy’s output gap closes and could undermine the value of dollar cash balances.

Market risk

While gold typically exhibits higher volatility than sovereign debt instruments, gold’s volatility is lower than most commodities and has been described in Basel II to be “in line with foreign currencies.”² Between the end of 1987 and the end of 2011, the annualised volatility of weekly returns on gold was 15.1% (Chart 1). Meanwhile, the volatility of other commodities, as measured by the Goldman Sachs GCSI index was 20.8% over the same period.³ While gold’s volatility is higher than US Treasuries, US Agencies, and other US dollar denominated debt instruments, gold’s volatility is significantly more stable across currencies.

Gold’s volatility needs to be viewed in the context of its positive skew. Gold’s volatility is higher on the upside than the downside. Typically, most asset prices tend to fall harder when negative news reaches the market compared to price increments when there is more upbeat news than expected. Conversely, negative economic or geo-political news tends to induce flight-to-quality inflows into gold, thus raising the price and producing the opposite effect.

Over the past 17 years, the annualised volatility of positive monthly gold returns was 17%, compared to 13.1% volatility when gold returns were negative for the same period. This positive skew is comparable to other safe haven assets that benefit from a positive volatility skew, such as US Treasuries and US Agencies, also illustrated in Chart 2. This positive volatility skew is a significant contrast to the negative skew exhibited by US equities over the same period, where the S&P 500 had volatility on its positive returns of 14.6% meanwhile a higher volatility on its negative returns of 17.9%.

ii “Is traded in an active secondary two-way market that has observable market prices, committed market makers, a large number of participants, and a high trading volume”

A two-way market with observable prices

Most gold trading takes place in the global Over-The-Counter (OTC) market, although gold products, including futures, options and exchange-traded funds, are also traded on numerous exchanges around the world. Gold can also be bought and sold through retail consumer channels.

Most physical settlement of gold traded in the OTC market occurs through the London market where the bullion banks are represented by the London Bullion Market Association (LBMA). The LBMA has eleven market making members (Appendix 1) that have agreed to quote two-way prices to each other during the London business day for agreed minimum quantities in gold.

The price of gold is “fixed” twice a day in London by members of the London gold fixing (Appendix 2). The fixing ensures that there is an international benchmark, published price (that is widely used as a pricing medium by producers, consumers, investors and central banks), a narrow dealing spread and that any quantity of gold may be dealt.

Since 1919, the fix has been carried out by five banks. At the start of each fixing, the Chairman announces an opening price to the other four members who relay the price down to their dealing rooms, who are in contact with as many bullion dealers as are interested (or who have interested clients). Each fixing member then nets off the positions and declares himself, as the representative of all those interested parties, as a net buyer or seller (and of how much), or to be in balance. If the market is out of balance with more gold required than offered, then the price will be adjusted upwards (and vice versa) until balance is achieved. At this point the price is declared fixed. On very rare occasions the price will be fixed when there is an imbalance, at the discretion of the chairman of the fix. The fix is thus entirely open and any market user may participate through his bank. More generally, the gold price is arguably one of the most widely known financial prices in the world.

A large number of participants

The gold market is very deep and liquid. Because gold is virtually indestructible nearly all of the gold that has ever been mined still exists. The total above ground stock of gold was estimated to be 166,600 tonnes in 2010, worth US\$ 8.4tn at the average 2011 gold price.⁴ However, not all forms of gold are relevant when we are considering gold's role within the financial sector. It is estimated that 84,200 tonnes of gold or 50.5% of the above ground stock of gold is held in the form of jewellery and a further 22,300 tonnes or 13.4% lies in technology and medical applications (or its use can no longer be identified). The remaining 60,100 tonnes is held in the form of investment by private investors or official institutions (Chart 3). It is this "financial gold" that serves as the best proxy for outstanding bond issuance or equity market capitalisation.

The value of "financial gold" when converted at the 2011 average gold price is approximately US\$3.0tn. If we compare the value of financial gold to the value of US government and US agency markets and to other major asset classes, such as corporate bonds and equities, we can see just how large the gold market is. It is larger on this basis than the US agency market, German bund market or UK Gilt market (Chart 5).

The depth of the gold market is one reason why gold remains one of the world's most important reserve assets. The world's central banks hold 13% of their reserves in gold. Gold is only exceeded by US dollar and euro denominated assets. The United States has the largest gold reserves in the world, at 8,133 tonnes or 74.5% of total reserves (Chart 6). The official sector's role in the gold market is a testament to the importance gold plays in persevering wealth and protecting against risks. This is partly why, collectively central banks bought 440 tonnes of gold in 2011, the highest level since 1964.

The gold market also benefits from a uniquely diverse demand base. Unlike financial assets, the gold market is not solely dependent on investment as a source of demand. In the five years to 2011, 54% of demand came from the jewellery sector (with demand heavily concentrated in India and China), 34% from investment, and 12% from the technology sector (Chart 4). Gold has a diverse range of buyers, stretching from Indian jewellery manufacturers, to electronic producers in Asia, to worldwide dentistry and medicine, to retail investment, to pension funds and central banks. The motivations and price elasticities of each sector are also very different adding further diversity to the demand base.

A high trading volume

The London Bullion Market Association (LBMA) estimates that the value of gold traded on a daily basis that is settled through the London market alone averaged US\$240bn in the first quarter of 2011.⁵ In reality daily trading volumes are even higher as gold is also settled in other parts of the world. But using the LBMA number alone and the previous number computed for the value of "financial gold", gold's turnover ratio is approximately 8.1%. This turnover level is higher than each of the major bond markets, including US Treasuries which have a turnover ratio of 6.0% (Chart 9). This finding may come as a surprise to many market observers as US Treasuries have been universally considered the most liquid asset. In fact this is partly a reflection of the decline in turnover in the Treasury market due to an increase in issuance since 2005. For example in 2005, the US Treasury market had a turnover of as high as 13.3%. Charts 7 and 8 illustrate the growth of both the US Treasury market and the gold financial market and the respective change in turnover.

iii “And, is a type of asset that investors have historically purchased in periods of financial market distress during which liquidity is impaired (flight to quality)”

“...the reason people hold gold is as a protection against what we call tail risk, really, really bad outcomes...” Chairman Ben Bernanke, Testimony to US House Financial Services Committee, 13 July 2011

Chairman Bernanke recently acknowledged gold’s usage as a tail risk hedge, i.e., providing protection to investors, exactly when financial markets are under stress or are impaired. Indeed, gold has a long history of safe-haven inflows during times of financial market duress. This stems from its quality, its liquidity, and its lack of correlation with other assets.

Gold has been widely acknowledged as a powerful tail-risk hedge, in large part due to gold’s low correlation with other assets. This means that when other assets are declining, gold is likely to be stable or even increasing. Gold displays a low or statistically insignificant correlation with practically every other major asset class, even other commodities. The long-term correlation of monthly returns between gold and equities and fixed income over the past 17 years has been negligible. For example, gold long run average correlation with the the Barclays US Treasury aggregate and the MSCI US index has been 0.06 and -0.05, respectively (-0.07 against the S&P500) Meanwhile, Gold’s correlation to other commodities, as measured by the S&P GSCI, was just 0.26 over the same period (Chart 10).

One example of gold’s powerful countercyclical tail-risk properties is gold’s performance when the equity market has undergone a significant decline. Chart 11 shows that gold has been slightly negatively correlated with the S&P 500 in periods when the S&P 500 declines very significantly by more than two standard deviations. Meanwhile, commodities as measures by the S&P GSCI Index are positively correlated to extreme negative movements in the S&P 500. However, banks and regulators are correctly less concerned about equity market shocks as they are with funding and liquidity shocks. These specific liquidity shocks were examined in Case Study conducted by the World Gold Council that is described in the next section and has been appended in full to this submission.⁶

Case Study demonstrates gold’s impact during liquidity events

The Case Study conducted by the World Gold Council examined the effect of adding gold to the Liquidity Coverage Ratio (LCR) and found that, by including gold as an eligible asset in bank liquidity buffers, commercial banks would reduce the volatility of their LCR portfolios, reduce the value-at-risk of their portfolios, and improve their risk-adjusted returns. The study also found that a portfolio with gold outperformed a portfolio without gold during the most extreme liquidity stress events over the past 10 years. Finally, the case study demonstrates that gold, on average, provided positive returns during credit events experienced by Bank Holding Companies and on days when bank equity indices declined significantly.

The Case Study specifically found the following results when comparing an optimal liquidity buffer with gold (which included a 3.5% and 8.1% allocation to gold) with an optimal portfolio excluding gold:

- 1 A commercial bank that held gold in its liquidity portfolio since 1994 would have witnessed less annualised volatility of 3.17% versus 3.55%, than a liquidity buffer without gold.
- 2 The liquidity buffer with gold had a lower estimated VaR of a maximum loss of US\$10.7mn on a portfolio of US\$1.0bn with a 99% confidence level, versus US\$12.9mn in a portfolio without gold.
- 3 The liquidity buffer portfolio with gold increased in every liquidity stress event over the past 10 years and outperformed the non-gold portfolio by an average of 24 basis points.
- 4 Gold on average outperformed US Treasuries and Agencies during Bank Holding Company credit events by as much as 33 basis points.
- 5 When the Dow Jones US Select Regional Bank Index or the XLF Financial Sector ETF declined by more than two standard deviations, gold on average increased by 22 and 15 basis points.

Why does gold reduce portfolio risk?

The Case Study shows that gold's low long-run correlation with other LCR assets makes gold a very unique and important diversifier for a liquidity portfolio. The study finds that the existing LCR assets are highly correlated with each other. For example US Treasuries having a strong correlation to both US Agencies and US non-financial corporate bonds, of .95, and .80, respectively (Chart 12). Meanwhile, gold has virtually no long-run correlation to these assets with correlation coefficient to US Treasuries, US Agencies, and US non-financial corporates of 0.16, 0.18, and 0.21, respectively (Chart 13). As gold is not correlated to other LCR assets, it helps to provide diversification by remaining stable (or rising) while other LCR assets decline. Gold's lack of correlation is particularly important during periods of financial stress as demonstrated in this Case Study, gold increased in value when other highly liquid assets declined.

Question 14 (Continued) “Are the criteria used for identifying additional assets for inclusion in the definition of highly liquid assets appropriate? If not, how and why should the Board revise the criteria?”

Two other criteria should be considered when assessing whether an asset should qualify as a highly liquid asset: its degree of correlation with other assets in the buffer and whether it has a proven track record of providing liquidity during times of crisis.

Correlation with other qualifying assets

Making sure each asset class meets the criteria set out in Section 252.57, should go a long way to ensuring the assets can be easily sold without a large haircut in the event of a liquidity shock. However, economic and financial shocks can come in many forms and affect any asset class, even sovereign debt, as shown by the European debt crisis. Therefore, having a larger basket of high quality assets that do not correlate with each other is preferable to having a basket with just a few assets, especially when the assets are strongly correlated with each other.

As it stands, the existing recommended Liquidity Coverage Ratio (LCR) assets are highly correlated with each other, while gold has no strong correlation with any of these assets. US Treasuries, US Agencies, and US non-financial corporate bonds consist of the primary LCR assets, which are all fixed income securities. The minimum cross correlation among these assets is .72 and gets as high as virtually perfectly correlated between US Treasuries and US Agencies with a correlation coefficient of .95. Gold on the other hand, is the least correlated asset (as uncorrelated as cash), with a correlation coefficient of no greater than 0.22 to any other LCR asset. Chart 16 illustrates the correlation coefficient of gold and US Treasuries to other LCR assets. A full correlation matrix of all the LCR assets is presented in the Case Study.

A proven record of providing liquidity

The assets should also have a proven track record of providing emergency liquidity during times of extreme stress. Gold was used in the official and private sectors to raise liquidity during the worst of the financial crisis. The Swedish Riksbank, for example, used gold at the height of the financial crisis to fund temporary liquidity assistance. Commercial banks also used gold during the European sovereign debt crisis to raise funding on a swap basis. The Bank for International Settlement, for example, undertook some 346 tonnes of gold swaps with commercial banks in 2010. From a liquidity perspective, given that gold has no credit risk, gold becomes an asset that investors are as comfortable with as other high quality securities, and thus are happy to receive it as collateral. In fact, gold financing rates declined rapidly during the peak of the financial crisis when Lehman Brothers declared bankruptcy, to levels lower than financing rates for US Treasuries and US Agency securities. This means that gold holders could raise US dollar funding for their gold at a lower financing rate than US Treasury and US Agency securities, two assets currently included in the LCR. Chart 14 illustrates how gold forward rates or financing rates (GOFO) declined significantly during the peak of the crisis.

The global regulatory landscape

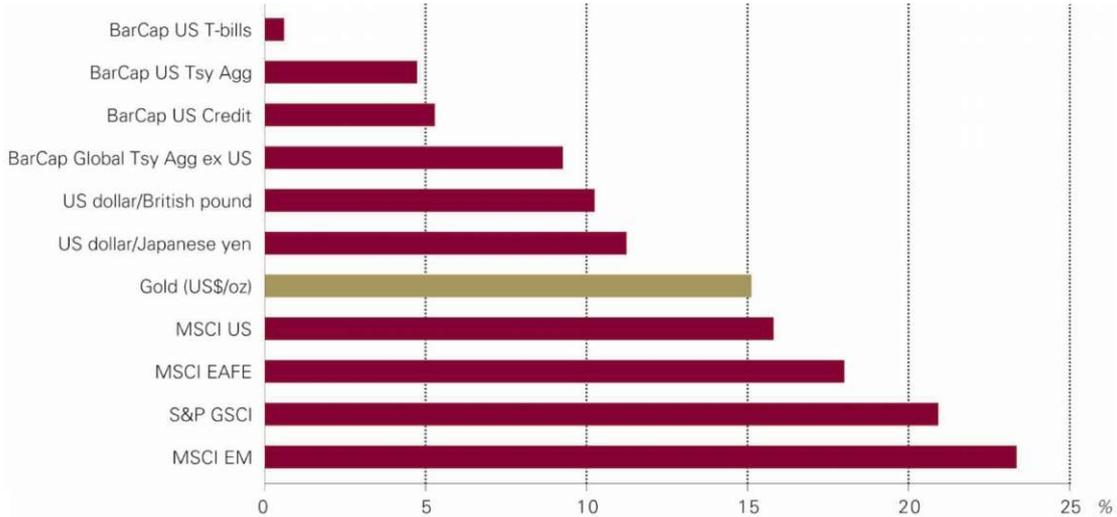
There is increasing recognition of gold's stabilising characteristics in the European Union's financial regulation. In July 2011 the European Parliament voted unanimously in favour of the inclusion of gold as "highly liquid collateral" under Article 43 of the European Market Infrastructure Regulation (EMIR), allowing institutions to post gold as collateral at clearing houses. This was upheld on 9 February 2012 when the EU co-legislators reached agreement on the final text. EMIR will become applicable law by end-2012. Some clearing houses in the EU, notably LCH Clearnet and ICE Clear Europe now accept gold as collateral, and we expect other European clearers to follow. Separately, in the U.S., CME Group, ICE, and J.P. Morgan accept gold as collateral.

A similar tendency can be seen in banking regulation. The European Commission (EC) released its proposal for the fourth Capital Requirements Directive on 20 July 2011 which will, inter alia, introduce the liquidity buffers. The report tasks the European Banking Authority (EBA) with specifying what constitutes a high quality liquid asset. European Lawmaker Otmar Karas who is responsible for passing the CRD IV rules through the European Parliament published his draft report on 19 December 2011. The draft report explicitly tasks the EBA with assessing the role of gold under the LCR. The third legislator, the European Council, has since followed suit.

There is widespread support within the global banking community for gold's inclusion as a high quality liquid asset. The Clearing House, the oldest banking association and payments company in the United States, recommends a more diversified spectrum of liquid assets to help mitigate the risk of unintended consequences. It is calling for the liquidity asset buffer to include gold due to its flight-to-quality tendencies and the strong performance of gold during the current crisis. Four prominent European banks and 11 European and international banking associations explicitly supported the inclusion of gold under the LCR in their consultation responses to the EC and BCBS (Appendix 4). Their calls for broadening the pool of eligible assets are now being supported by a number of Member States in the European Council, contending that the rules proposed by the EC are too restrictive and overly focused on government bonds.

Charts

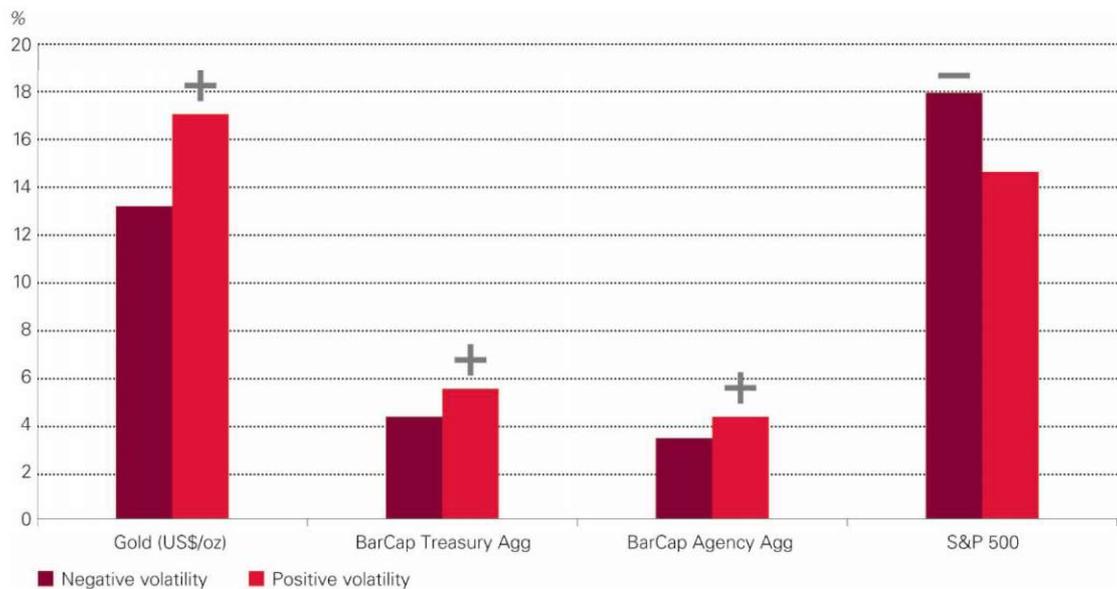
Chart 1: Annualised volatility (%) of monthly returns from December 1986 to December 2011 for select asset classes*



* Some indices inception after December 1986 and calculations reflect data from inception to December 2011.

Source: Barclays Capital, Bloomberg, J.P. Morgan, World Gold Council

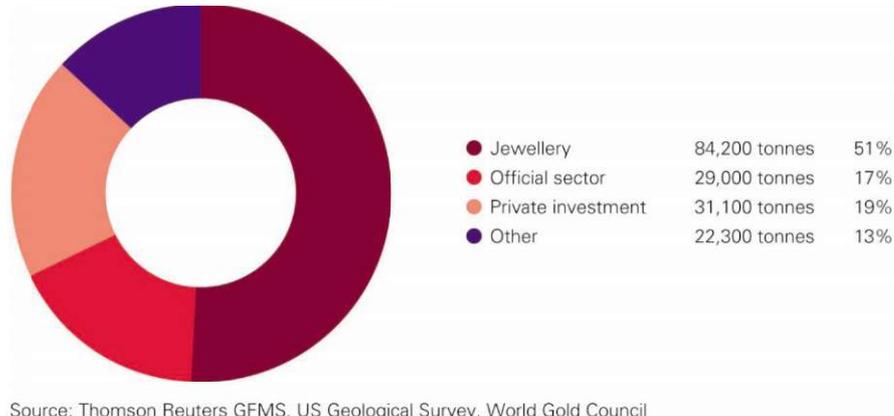
Chart 2: Annualised volatility of positive and negative monthly returns (Volatility skew)



* Return data from January 1994 to December 2011.

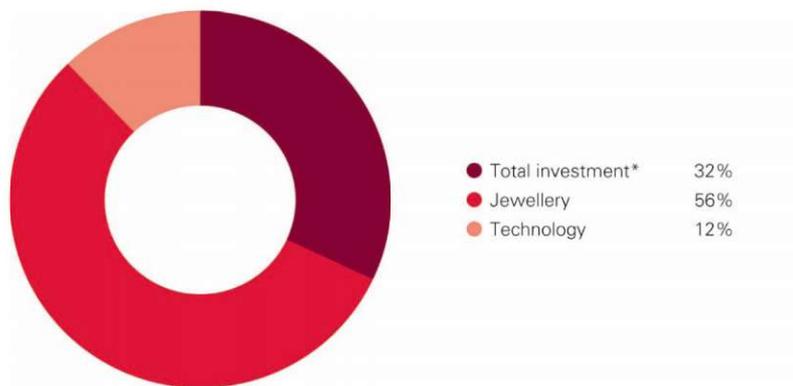
Source: Bloomberg, LBMA, World Gold Council

Chart 3: Physical above ground stock breakdown (2010)



Source: Thomson Reuters GFMS, US Geological Survey, World Gold Council

Chart 4: Distribution of demand: 5-year average (2007–2011)



* Total investment includes bars and coins, ETFs, OTC investment but excludes central banks.

Source: Thomson Reuters GFMS, World Gold Council

Chart 5: Size of various debt markets and financial gold

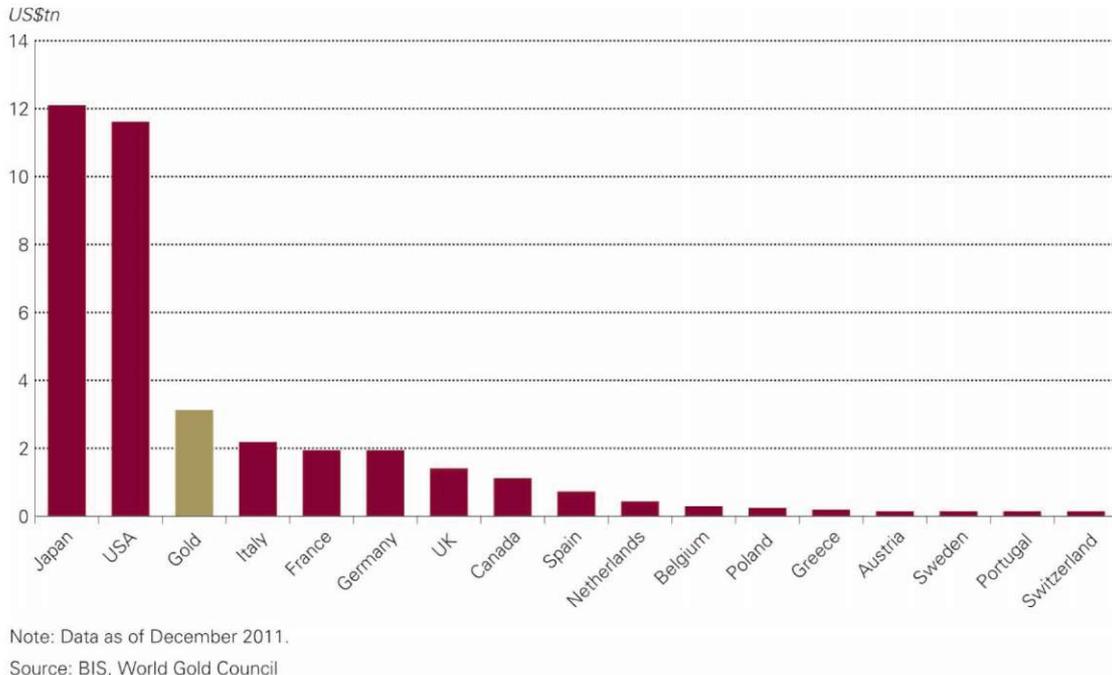


Chart 6: Central bank reserves of gold in tonnes

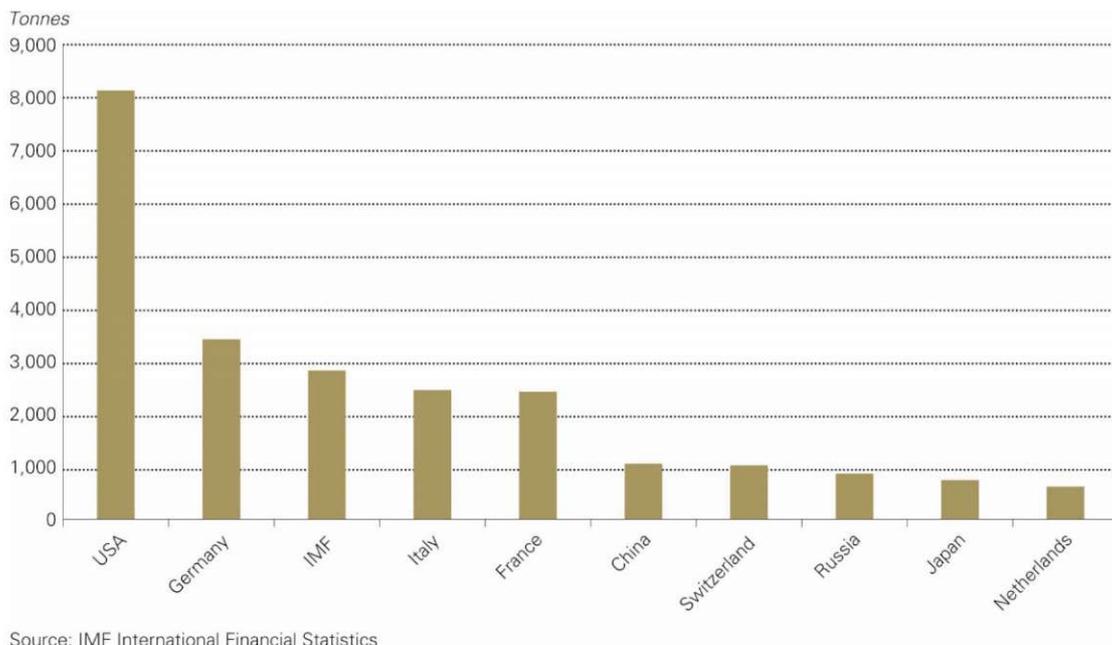
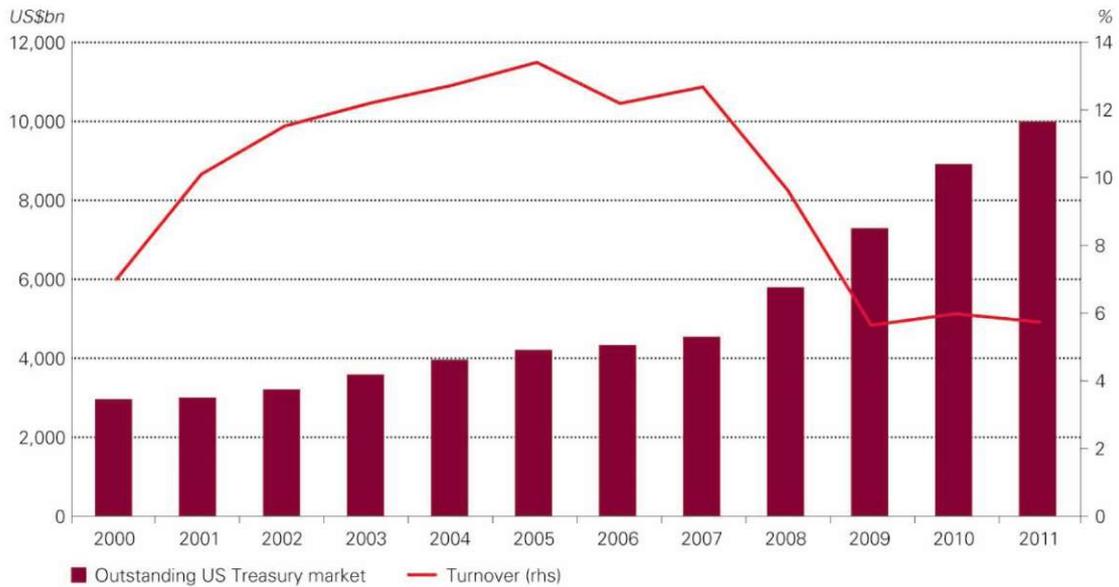


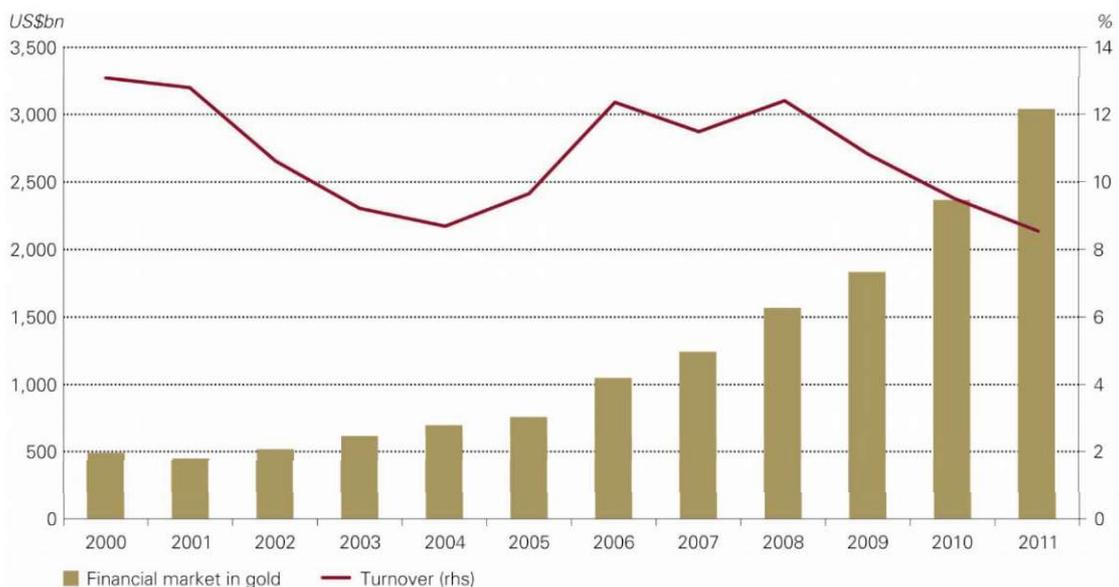
Chart 7: US Treasury securities total outstanding and estimated average daily turnover



Note: Turnover calculated by dividing average daily trading volume by the total outstanding US Treasury market.

Source: SIFMA primary market survey statistics

Chart 8: Gold financial market and estimated average daily trading turnover

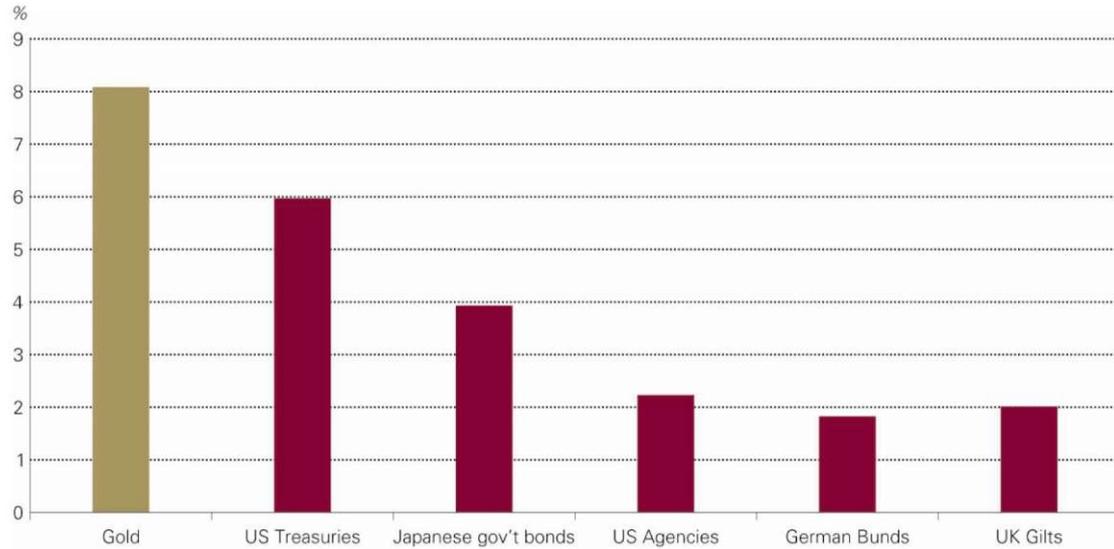


Note: Turnover calculated by dividing average daily trading volume by financial market in gold.

Daily trading volume estimates using LBMA clearing statistics and a multiple of 10 to reflect netting of trades before clearing.

Source: GFMS, LBMA, World Gold Council

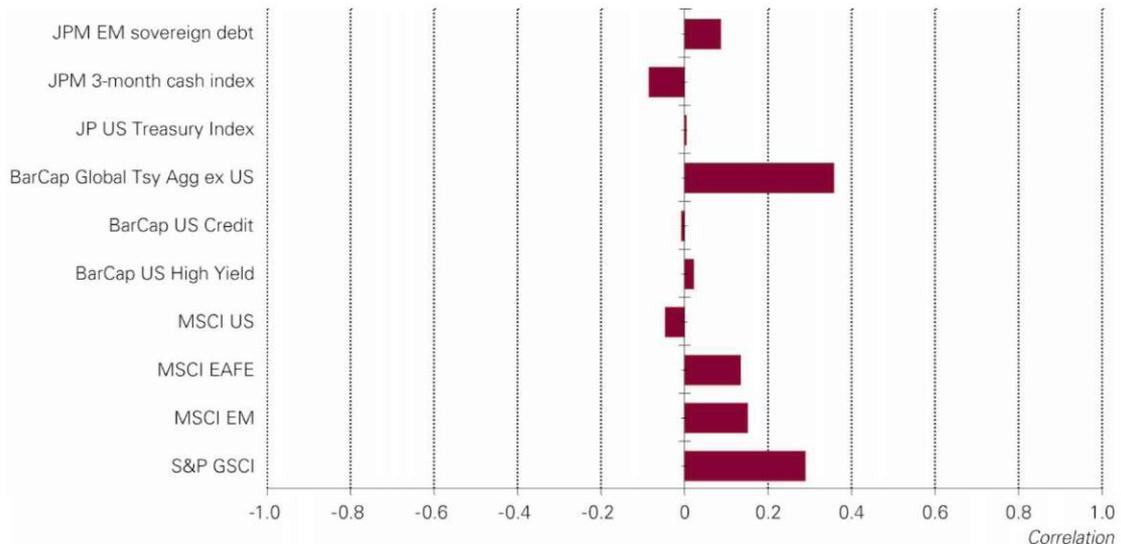
Chart 9: Average daily turnover*



*Daily turnover equals average daily volume divided by total outstanding value.

Source: German Finance Agency, Japanese MOF, LBMA, SIFMA, Thomson Reuters GFMS, UK DMO, World Gold Council

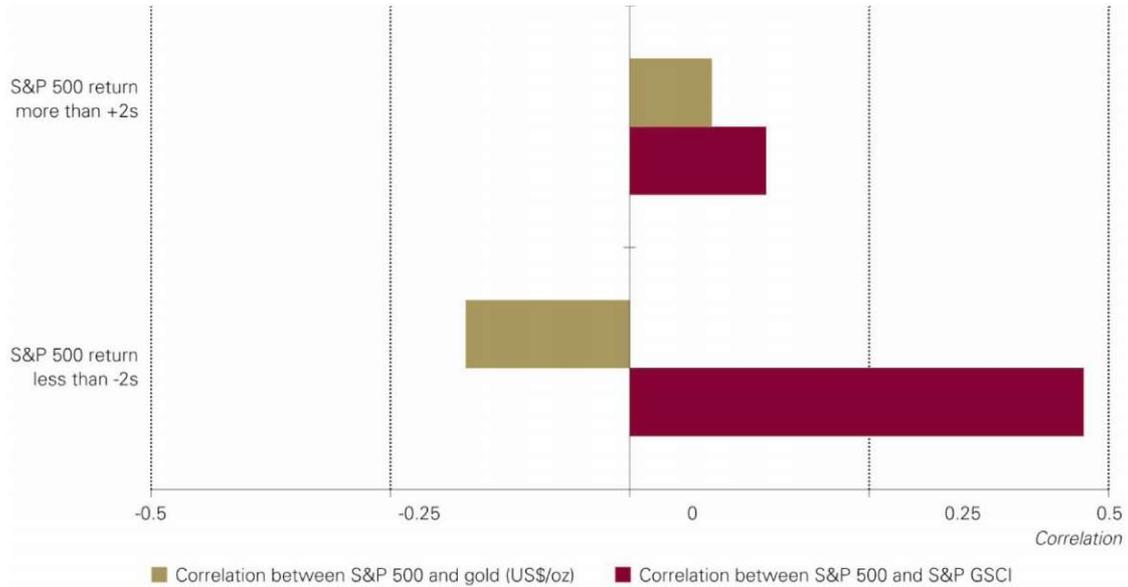
Chart 10: Long-term correlation of monthly returns from December 1986 to December 2011 between gold (US\$/oz) and select asset classes (US\$)*



* Some indices incepted after December 1986 and calculations reflect data from inception to December 2011.

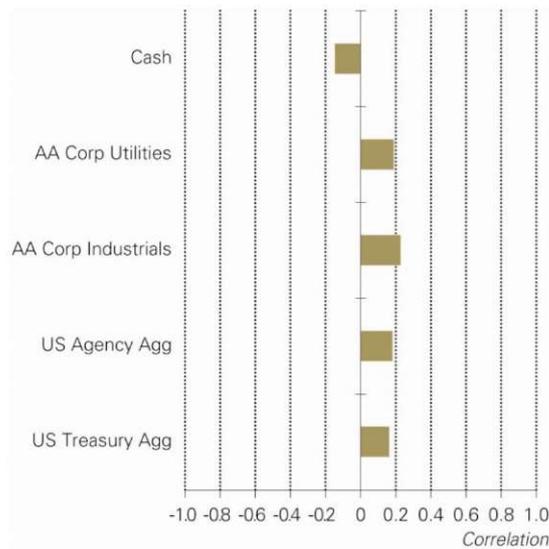
Source: Barclays Capital, Bloomberg, J.P. Morgan, LBMA, World Gold Council

Chart 11: Long-term weekly-return correlation between equities, gold and commodities to S&P 500 during extreme moves*



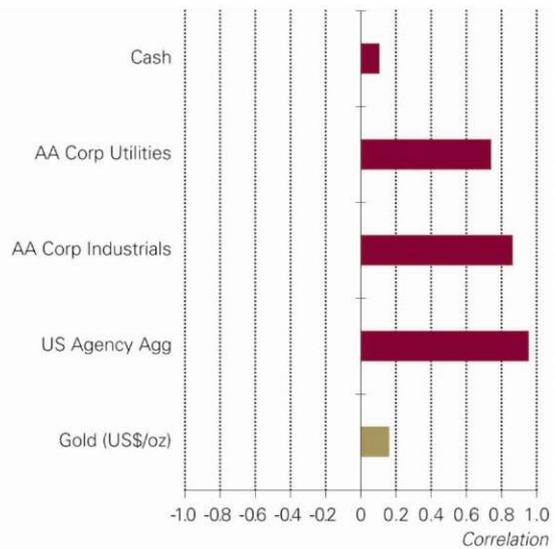
* Return data from January 1987 to July 2010.
Source: Bloomberg, LBMA, World Gold Council

Chart 12: Correlation to other Basel LCR assets: Gold vs.



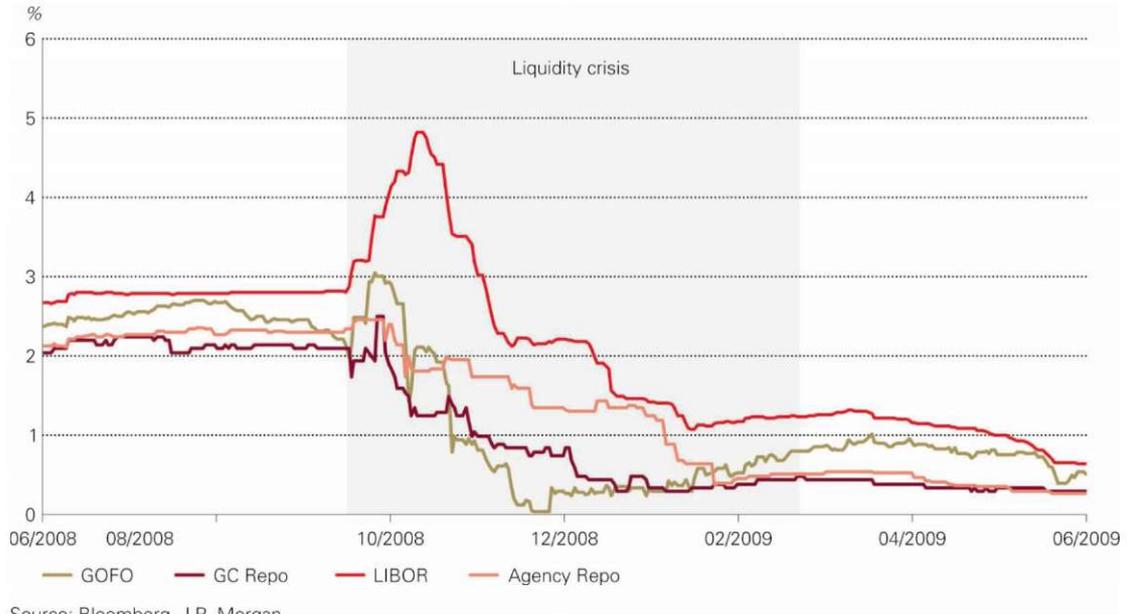
Note: Monthly returns from January 1994 to December 2011.
Source: Barclays Capital, Bloomberg, World Gold Council

Chart 13: Correlation to other Basel LCR assets: US Treasuries vs.



Note: Monthly returns from January 1994 to December 2011.
Source: Barclays Capital, Bloomberg, World Gold Council

Chart 14: Three month financing rates of Gold, US Treasuries, US Agencies, and LIBOR



Appendix 1

How gold is different from other commodities

Gold is not like other commodities and should be the only commodity to be included as a highly liquid asset.⁷ The financial market in gold is large, deep, and among the most liquid of financial assets. Gold trades in an around the clock global market, serving both as a monetary asset as a quasi currency, and as a financial asset as a form of investment. Gold has been used in this manner since as early as 500 BC when the first gold coin was struck. For hundreds of years gold served an important official role in the global monetary system when many countries backed their currencies with gold. While gold no longer has a legal role in the world's monetary system, central banks and governments continue to hold 17.5% of all above ground stocks of gold and hold it as one of their largest reserve assets in order to preserve the wealth of society and protect against macroeconomic and financial shocks.⁸

Official recognition for gold

Official institutions, regulators, and market participants treat gold differently because gold as a financial asset behaves very different from commodities. Basel II recognizes gold as currency as its volatility is much more in line with other currencies. Basel II also classifies gold as a zero-risk weighted asset for gold liabilities.⁹ The International Monetary Fund categories gold held by monetary authorities as a financial instrument termed as "monetary gold."¹⁰ As gold is a truly a global market with extremely diverse sources of demand and supply, the gold market's financial properties are extremely different from the broader set of commodities. Many of these differences have been pointed out in this submission, which include: its lower volatility, its depth and liquidity of over-the-counter market trading, its minimal correlation with other assets, and its safe haven qualities.

OTC market in gold is more important than derivatives

In sharp contrast to most of the other commodities, the vast majority of gold trading takes place in the global over-the-counter wholesale market. World Gold Council research estimates that gold trading in the US futures market would represent only a small component of all global trading in gold, at most 15-20%, with trading volumes dominated by the global wholesale OTC market.¹¹

Gold is not consumed

Unlike agricultural and energy commodities, gold is not consumed in a normal sense as virtually all of the gold that has ever been mined still exists. The vast majority of gold remains in use in the hands of central banks and governments, financial institutions and other commercial institutions, as well as the general public in the form of jewelry and dentistry. This contrasts significantly with the other commodities, which can be more finite in supply and can spoil or be spent in normal consumption behavior. The existence of large and liquid above ground stocks means the supply of gold to the market does not suffer similar pressures as other commodity markets.

Gold is geographically diverse

Gold mine production is derived from numerous separate operations on all continents of the world (other than Antarctica) making it a truly global commodity with limited supply concentration risks in contrast to many other commodities. For example, no single region produces more than 20% of global mine supply. Therefore, any disruption to production in any one locality is unlikely to affect a significant number of these operations simultaneously. Furthermore, the rapid mobilization of above ground gold stocks from fabricated sources like jewelry can help to support any supply shortages by its re-entry into the market through recycling of gold. Gold demand is equally geographically diverse, with demand coming from: India - 26%, Greater China – 19%, Europe and Russia -16%, North America - 13%, Middle East – 9%, and all other regions – 17%.¹²

Despite being tangible, gold is traded like other securities

While gold is indeed more than a paper instrument, gold is held in custody in a similar fashion to financial securities. Therefore, when gold is traded between two parties, SWIFT messages are sent to either party's custodian to clear the trade. Gold bullion custodians, which include the Bank of England, then clear trades between the physical accounts they have with other custodians. From time to time trucks and airplanes may be required to ship gold, but for the most part, large trades and swaps can be cleared without a leaving a custodian's vault.

Appendix 2

LBMA market-making members

Market makers have agreed to quote two-way prices to each other during the London business day for agreed minimum quantities and tenors in both gold and silver. As shown below, each Market Maker has elected to quote in one or all of Spot (S) Forwards (F) and Options (O).

Market-making member	Address	Markets
The Bank of Nova Scotia – ScotiaMocatta	201 Bishopsgate, 6th Floor, London EC2M 3NS	S, F
Barclays Bank Plc	Barclays Capital, 5 The North Colonnade, Canary Wharf, London E14 4BB	S, F, O
Credit Suisse	One Cabot Square, London E14 4QJ	S, O
Deutsche Bank AG	Winchester House, 1 Great Winchester Street, London EC2N 2DB	S, F, O
Goldman Sachs International	River Court, 120 Fleet Street, London EC4A 2BB	S, F, O
HSBC Bank USA NA	Level 4, 8 Canada Square, London E14 5HQ	S, F, O
J.P. Morgan Chase Bank	London Wall, London EC2Y 5AJ	S, F, O
Merrill Lynch International Bank Limited	2 King Edward Street, London EC1A 1HQ	O
Mitsui & Co Precious Metals Inc	4th Floor, St Martins Court, 10 Paternoster Row, London EC4M 7BB	S
Société Générale	Exchange House, Primrose Street, London EC2A 3HT	S, F
UBS AG	100 Liverpool Street, London EC2M 2RH	S, F, O

Appendix 3

Members of the London Gold Fixing

Member	Address
The Bank of Nova Scotia – ScotiaMocatta	201 Bishopsgate, 6th Floor, London EC2M 3NS
Barclays Bank Plc	Barclays Capital, 5 The North Colonnade, Canary Wharf, London E14 4BB
Deutsche Bank AG	Winchester House, 1 Great Winchester Street, London EC2N 2DB
HSBC Bank USA NA	Level 4, 8 Canada Square, London E14 5HQ
Société Générale	Exchange House, Primrose Street, London EC2A 3HT

Appendix 4

Industry support for gold as a high quality liquid asset

The inclusion of gold under the LCR is supported by four prominent European banks and 11 industry associations, who explicitly referenced gold in the LCR in their submissions to the BCBS¹³ and EC consultations.¹⁴

Equities are not recognised as liquid assets. Likewise, gold and other precious metals are not recognised as liquid assets. Given that these asset classes have proven to be very liquid over the last two years of crisis, this treatment seems too restrictive. [...] Therefore, these assets should be recognised as inflows for the LCR and should not require term funding under the NSFR.

HSBC [BCBS and EC]

We suggest that certain precious metals, such as gold and silver, be given a liquidity value in the definition of “liquid assets”. While a conservative haircut should be applied, for example 25%, it is unreasonable to ascribe zero liquidity value to all precious metals positions for LCR purposes.

UBS [BCBS]

Gold has a well established role as safe haven asset during a crisis and has proven to be highly liquid in times of stress. In fact, gold is regarded as being cash equivalent. During a crisis gold prices tend to rise and such positions can be rather sold-off with a gain. We therefore propose an RSF factor of 0% for this category.

Credit Suisse [BCBS]

Almost the same severe haircut deductions on liquid asset buffers are applied for the longer term availability in the NSFR as in the LCR. This is unrealistic and leads to a disproportionately high long term funding requirement for a large range of marketable assets. [...] Moreover, as with the LCR, the complex cumulative haircut assumptions defined in Annex 2 for fixed income papers, equities, gold, etc. should not be applied here.

European Banking Federation [BCBS and EC]

No mention is being made of some assets which are obviously highly liquid (such as equities, gold and other precious metals, commodities, mortgage-backed securities, instruments issued by the US Federal National Mortgage Association and Federal Home Loan Mortgage Corporation and credit claims), without any explanation being provided.

We suggest including such assets either in the liquidity buffer or in the LCR as inflows, with haircuts which are determined on the basis of their characteristics. Note that the haircut would need to be different depending on whether the calculation is done for LCR and NSFR purposes.

British Bankers Association (BBA), International Swaps and Derivatives (ISDA), Global Financial Markets Association (GFMA) [BCBS]

We suggest including gold and other precious metals as well as commodities in a wider definition of the liquidity buffers, subject to the application of an appropriate haircut. We would further argue that gold has a rich tradition in banking and that in times crisis there is normally a flight to gold, so we also question how the Committee arrived at the 50% treatment of gold under the NSFR.

European Repo Council / Euribor ACI – The Financial Markets Association [BCBS and EC]

Equities, gold and other precious metals are not eligible as liquid assets. This treatment is too restrictive and cannot be justified by the experience made during the crisis. These assets should be recognised as inflows. These assets should be recognised as inflows for the LCR and should not require term funding under the NSFR.

Institute for International Finance [BCBS and EC]

It is striking that gold is not recognised as having any liquidity value, whereas gold is virtually always liquefiable for cash and tends to benefit from a perceived “safe haven” status during crises (so that price volatility would normally be upwards) [...] The 50% RSF factor for gold seems extreme, given gold’s well-established role as a haven in crises. [...] This paragraph states all criteria must be met to qualify for 50% RSF, yet some of the criteria would not apply to some of the assets in question (e.g. gold and bonds are for the most part not listed on exchanges; equities are generally not eligible at central banks).

ACI Germany – Financial Markets Association Germany [BCBS]

Equities, gold and other precious metals are not eligible as liquid assets. This treatment is too restrictive and cannot be justified by the experience made during the crisis. These assets should be recognised as inflows.

Italian Bankers Federation [BCBS and EC]

The inclusion of the “listed equity” among assets to be financed with funding if durations are longer than one year appears to be too restrictive. The listed equities, if not referring to equity investments, should be included (albeit with appropriate haircuts) among the liquid assets. Equal treatment should be reserved for corporate securities with a rating less than AA but investment grade and Gold.

The **London Bullion Market Association** has endorsed the World Gold Council’s calls for gold to be included in the LCR.

Appendix 5

Glossary of terms

Account – allocated

An account in which the client's metal is individually identified as his, and physically segregated from all the other gold in the vault; in the event of a default by the holding bank, the investor becomes a secured creditor.

Account – unallocated

An account in which the client's bars are not specifically ring-fenced, and which may be cheaper than an allocated account as some banks do not charge for storage. The client carries higher counterparty risk, however, as he is an unsecured creditor in the event of a default by the holding bank.

Bar

Typical gold product, either for trading or for accumulation. Bars come in a variety of shapes weights and purities and different bars are favoured in different parts of the world.

Fix

The London gold fixing (see: www.goldfixing.com) takes place twice daily over the telephone and sets a price at which all known orders to buy and sell gold on a spot basis at the time of the fix can be settled. The fix is widely used as the benchmark for spot transactions throughout the market. The five members of the fix 'meet' at 10:30 and 3:00 London time and commence the fix with a trying price. The fixing members' representatives relay the price down to their dealing rooms, who are in contact with as many bullion dealers as are interested (or who have interested clients) and these market members then declare how much metal, on a net basis, they require to buy or sell at that level. The dealers are themselves in contact with their clients, who may change their order, or add or cancel an order, at any time. The position declared by the dealers is the net position outstanding between all their clients (i.e. if one bank has clients wanting to buy a total of two tonnes, and other clients wanting to sell a total of one tonne, then he declares himself as a buyer of one tonne). Each fixing member then nets off the position and declares himself, as the representative of all those interested parties, as a net buyer or seller (and of how much), or to be in balance. If the market is out of balance with more gold required than offered, then the price will be adjusted upwards (and vice versa) until balance is achieved (because some clients will withdraw or amend their orders if the price does not suit them). At this point the price is declared fixed. On very rare occasions the price will be fixed when there is an imbalance, at the discretion of the chairman of the fix. The fix is thus entirely open and any market user may participate through his bank.

Gold Forward Offered Rate (GOFO)

This is the rate at which bullion banks are willing to lend gold on a swap against dollars (borrow dollars) or put another way two transactions defined by first selling gold and receiving dollars, and then second buying back the gold and with the initial dollar amount plus the GOFO interest.

Good delivery standard

The specification to which a gold bar must conform in order to be acceptable on a certain market or exchange. Good delivery for the London Bullion Market is the internationally accredited good delivery standard. A good delivery bar for London should weigh between 350 and 430 ounces (gold content), of minimum purity 99.5% (two nines five). Further specifications can be obtained from London Bullion Market Association (LBMA) at www.lbma.org.uk.

LBMA

The London Bullion Market Association (LBMA) acts as the coordinator for activities conducted on behalf of its members and other participants in the London Bullion Market, and it is the principal point of contact between the market and its regulators.

Lease rate

The gold lease rate is derived from the LIBOR and the Gold Forward Offered rates (GOFO):
Lease rate = LIBOR – GOFO.

¹ See the IMF's recent Global Financial Stability Report which examines the issue of growing scarcity of safe assets. The IMF notes that the "deterioration of some advanced economies' fiscal profiles has reduced the supply of sovereign debt perceived as safe." Furthermore, it notes that "Banks' sizable sovereign exposures, in part related to regulatory incentives, can act as a contagion channel between sovereigns and the banking sector with knock-on effects to the economy." The IMF includes gold as part of its study of safe assets, noting that the gold represents 11% of "Outstanding Amounts of Marketable Potentially Safe Assets." See International Monetary Fund, Global Financial Stability Report, Chapter 3: Safe Assets: Financial System Cornerstone?, April 2012

² Bank of International Settlements, *International convergence of capital measurement and capital standards*, June 2006 (Basel II).

³ See Appendix 1 *How gold is different from other commodities*.

⁴ Above ground stock is estimated by Thomson Reuters GFMS and the average gold price for 2011 was US\$1,571.50 per oz.

⁵ See Loco London Survey conducted by LBMA with Bank of England, http://www.lbma.org.uk/assets/LoCo_London_Liquidity_Surveyrv.pdf

⁶ See World Gold Council *Case Study: Examining the impact of including gold in the LCR*.

⁷ See World Gold Council report, *Gold: a commodity like no other*, April 2011.

⁸ Thomson Reuters GFMS, 2011.

⁹ International convergence of capital measurement and capital standards, June 2006, Bank of International Settlements.

¹⁰ International Monetary Fund, *Monetary and financial statistics manual*, October 2000.

¹¹ See note 6.

¹² Thomson Reuters GFMS, 2011.

¹³ The Clearing House, *The Basel III Liquidity Framework: Impacts and recommendations*, 2 November 2011. Basel Committee on Banking Supervision (BCBS) consultation, December 2009.

¹⁴ European Commission Consultation, February 2010.

Case study: Enhancing commercial bank liquidity buffers with gold



About the World Gold Council

The World Gold Council is the market development organisation for the gold industry. Working within the investment, jewellery and technology sectors, as well as engaging in government affairs, our purpose is to provide industry leadership, whilst stimulating and sustaining demand for gold.

We develop gold-backed solutions, services and markets, based on true market insight. As a result, we create structural shifts in demand for gold across key market sectors.

We provide insights into the international gold markets, helping people to better understand the wealth preservation qualities of gold and its role in meeting the social and environmental needs of society.

Based in the UK, with operations in India, the Far East, Europe and the US, the World Gold Council is an association whose members include the world's leading and most forward thinking gold mining companies.

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Executive summary

The following case study conducted by the World Gold Council examined the effect of adding gold to the Liquidity Coverage Ratio (LCR) and found that, by including gold as an eligible asset in bank liquidity buffers, commercial banks would reduce the volatility of their LCR portfolios, reduce the value-at-risk of their portfolios, and improve their risk-adjusted returns.

The study also found that a portfolio with gold outperformed a portfolio without gold during the most extreme liquidity stress events over the past 10 years. Finally, the case study demonstrates that gold, on average, provided positive returns during credit events experienced by Bank Holding Companies and on days when bank equity indices declined significantly.

This analysis specifically found the following results when comparing an optimal liquidity buffer portfolio with gold (which included a 3.5% and 8.1% allocation to gold) with an optimal portfolio excluding gold:

- A commercial bank that held gold in its liquidity portfolio since 1994 would have witnessed less annualised volatility of 3.17% versus 3.55%, than a liquidity buffer without gold.
- The liquidity buffer with gold had a lower estimated VaR of a maximum loss of US\$10.7mn on a portfolio of US\$1.0bn with a 99% confidence level, versus US\$12.9mn in a portfolio without gold.

- The liquidity buffer portfolio with gold increased in every liquidity stress event over the past 10 years and outperformed the non-gold portfolio by an average of 24 basis points.
- Gold on average outperformed US Treasuries and Agencies during Bank Holding Company credit events by as much as 33 basis points.
- When the Dow Jones US Select Regional Bank index or the XLF Financial Sector ETF declined by more than two standard deviations, gold on average increased by 22 and 15 basis points.

I: Optimal portfolio construction

The current recommendations from the Basel Committee on Banking Supervision (BCBS) are that the Liquidity Coverage Ratio (LCR) can include cash, central bank reserves, and zero risk-weighted sovereign debt/central bank debt as Level 1 assets. For Level 2 assets, the pool is expanded to include quasi-sovereign debt and non financial corporate and covered bonds with a 15% haircut applied to the market value. To most closely match these assets from a US commercial bank perspective, this study utilised Barclays Capital aggregates listed in Table 1.¹

Period of analysis

Seventeen years of monthly historical data from January 1994 to December 2011 was used for this study to determine estimates for volatility and long-run average correlations between the asset categories. In addition to volatility and correlations, this optimisation study needed an estimated return for each asset. As past performance of both gold and fixed income securities over the last seventeen years would not be an appropriate forward looking measure (as for example cash returned 3.3% during this period) this study instead used 'Yield to Worst' values calculated by Barclays Capital as of 31 December, 2011. These return estimates such as 1% for US Treasuries and 2.9% for non-financial corporate bonds are

more appropriate in the current interest rate environment for this study. As no such yield estimate is available for gold, this study estimated that gold would return 2% in-line with the widely perceived long-term 'target' for inflation anticipated by US monetary authorities. As gold has typically exceeded inflation over a long horizon, this assumption provides a similar level of conservatism to the analysis as the 'Yield to Worst' framework.

Observation on correlations

The analysis shows that gold's low long-run correlation with other LCR assets makes gold a very unique and important diversifier for a liquidity portfolio. The existing LCR assets are highly correlated with each other. For example, US Treasuries have a strong correlation to both US Agencies and US non-financial corporate bonds, of .95, and .80, respectively. Meanwhile, gold has virtually no long-run correlation to these assets with correlation coefficient to US Treasuries, US Agencies, and US non-financial corporates of 0.16, 0.18, and 0.21, respectively. As gold is not correlated to other LCR assets, it helps to provide diversification by remaining stable (or even rising) while other LCR assets decline. This diversification quality is important in a quantifiable manner and, as such, the optimiser recognises this trait and allocates to gold to lower the volatility of the liquidity portfolio.

Table 1

Asset name	Basel characteristics		Return and volatility		
	Basel category	Asset group	Estimated return**	Standard deviation	Information ratio
Barclays Capital US Treasury Agg	Sovereign debt	Level 1	1.0%	4.7%	0.22
Barclays 1-3 month bills	Cash and central bank reserves	Level 1	0.0%	0.6%	0.03
Gold (US\$/oz)	Gold	Level 2	2.0%	15.1%	0.13
Barclays Capital US Agency Agg	Quasi Sovereign debt	Level 2	1.2%	3.7%	0.33
Barclays Capital Non-financial Corp*	Non-financial corporates	Level 2	2.9%	6.3%	0.46

* Barclays Capital non-financial corporate index was created using the Barclays Capital Industrial AA and Barclays Capital Utilities AA indices.

**Yield to worst values were used as forward return estimates for all Barclays Capital indices and are as of 31 December 2011.

The return estimate for gold is based on the assumption that gold returns track the widely perceived 2.0% long term 'target' for inflation by US monetary authorities.

¹ The study utilised Barclays 1-3 month bills aggregate for cash and central bank reserves, for sovereign debt it utilised the US Treasury Aggregate. For quasi-sovereign debt the US Agency Aggregate was used and for corporate bonds a non-financial corporate bond index was created using the Industrial AA and Utilities AA corporate bond aggregates.

Optimisation method

In order to analyse this data New Frontier Advisors (NFA) patented portfolio optimiser which pioneered the technique of resampled efficiency optimisation was used. The Michaud Re-sampled Efficient Frontier™ has been acknowledged by Harry Markowitz, founder of modern risk-adjusted return portfolio theory, to be more effective and robust than classical mean-variance optimisation.² In particular the re-sampled portfolio results tend to be more robust and less reliant on return and volatility assumptions being 100% accurate.³ After providing return, volatility, and correlation inputs, the optimiser drew from a multivariate normal distribution to generate 1,000 efficient frontiers which were then averaged to create the Michaud Re-sampled Efficient Frontier™. This efficient frontier is represented by 51 optimal portfolios that correspond to asset allocations that maximise return for a given level of risk. In this case study, the minimum risk portfolio and the optimal portfolios are examined in detail.

Constraints

There were two constraints applied to this analysis. The first constraint was to limit Level 2 assets to 40% of the LCR, consistent with the existing recommendations from the Basel Committee. Therefore in this study, the US Agencies Aggregate, US non-financial corporates, and Gold⁴ were limited to a maximum of 40% of the portfolio. The second constraint was to limit the cash position in the LCR to 25% of the LCR. As cash has the lowest volatility, without a constraint, the optimisation exercises allocates a significant majority of the LCR to cash in lowest risk optimal portfolio. A limit of 25% was selected as it was most consistent with the level of cash held in aggregate across the global banking system when the BCBS conducted their Quantitative Impact Study⁵ released in December 2010. In this study the committee provided an aggregate breakdown of the composition of holdings of liquid assets.

Table 2

Asset name	Correlation matrix				
	US Treasury Agg	Barclays 1-3 month bills	Gold (US\$/oz)	US Agency Agg	Non-financial corporates
Barclays Capital US Treasury Agg	1.00	0.12	0.06	0.95	0.84
Barclays 1-3 month bills	0.12	1.00	-0.14	0.16	0.03
Gold (US\$/oz)	0.06	-0.14	1.00	0.08	0.11
Barclays Capital US Agency Agg	0.95	0.16	0.08	1.00	0.83
Barclays Capital Non-financial Corp	0.84	0.03	0.11	0.83	1.00

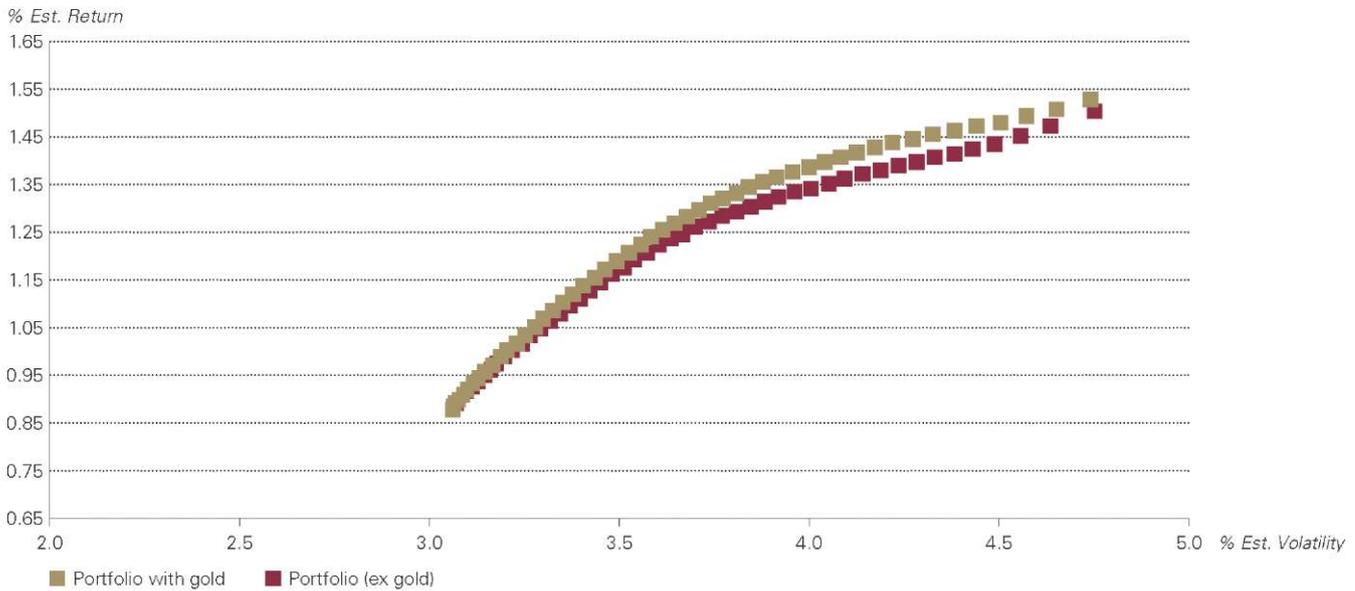
2 See *Journal of Investment Management*, Vol. 9, No. 4, 2011, pp 1-9. JOIM Conference Series Dr. Harry M. Markowitz interview with Dr. Richard O. Michaud, San Diego, 6 March 2011, Conference Summaries.

3 The advantage of using Michaud's methodology lies in the fact that by resampling, the optimal weights diminish their dependence on the average returns, volatility and correlations used as assumptions of future performance. It is equivalent to consider a point estimate versus a confidence interval. The point estimate can be unbiased and consistent but it gives no sense of certainty. Instead, a confidence interval summarises both the best guess on what the parameter value is but also what other possible values it can take. Similarly, the Re-sampled Efficient Frontier allows for the estimation of confidence intervals around the optimal weights that would deliver the maximum return for a given level of risk.

4 It is the World Gold Council's conservative recommendation that gold is included as a Level 2 asset within the LCR framework.

5 Bank of International Settlements, *Results of the comprehensive quantitative impact study*, December 2010.

Chart 1: Resampled efficient frontiers of optimal portfolios with gold and excluding gold



Source: Barclays Capital, Bloomberg, New Financial Advisors Optimizer, World Gold Council

Optimal LCR portfolios with gold and without gold

The result of the optimisation analysis shows that gold improves risk-adjusted returns for median levels of risk and higher. This is demonstrated by the expansion of the efficient frontier when gold is included in the investment universe. Chart 1 illustrates an efficient frontier constructed from the existing LCR assets (US Treasuries, US Agencies, Non-financial corporates, and cash), which graphs the level of expected return for each level of expected risk. Once gold was included in the LCR, the range of returns was expanded for all levels of risk – thereby pushing upward and toward the left, the efficient frontier. Importantly, the optimisation provided a 97.5% confidence level that an allocation of gold should be at a minimum of 2%. Thus, gold’s inclusion in the LCR was statistically significant to a very high degree.

Optimal portfolio

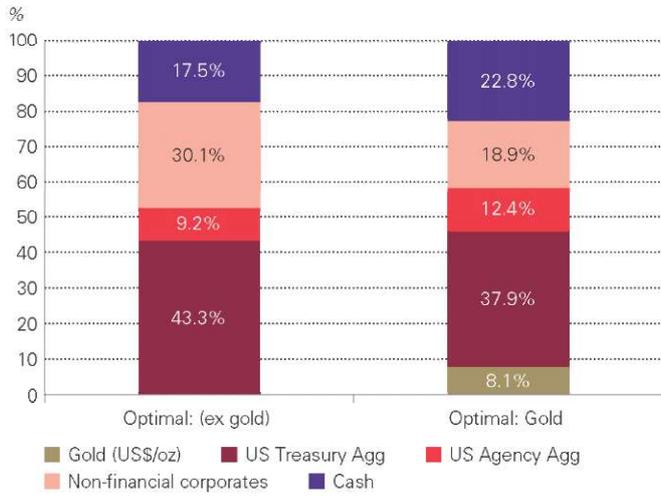
This case study examines two points on each of the efficient frontiers to examine the impact that gold has when included in the LCR. The first point that is examined on each efficient frontier is the ‘optimal portfolio’ allocation. This is the allocation

of the LCR assets that provides the highest expected information ratio or risk-adjusted return. As this portfolio is mathematically optimal, comparing an optimal portfolio with gold versus an optimal portfolio excluding gold should provide the best results for each LCR portfolio. Chart 2a depicts the optimal portfolio with gold and excluding gold. The optimal portfolio with gold included a small allocation to gold of 8.1% and involved the substitution of each of the other LCR assets.

Minimum risk portfolio

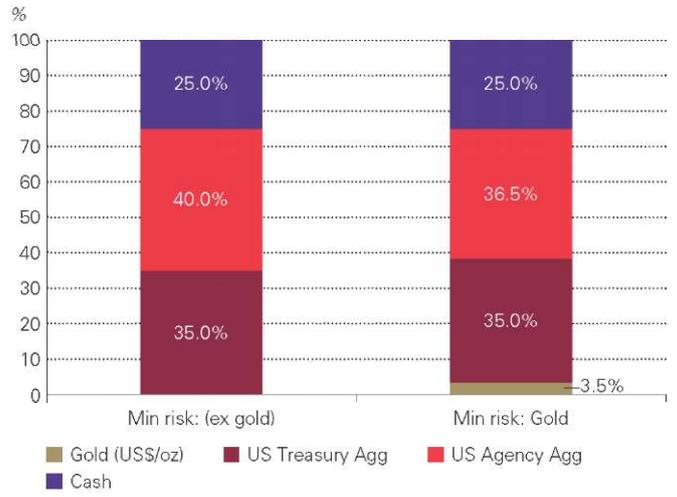
The second point that is examined is the ‘minimum risk’ (Min risk) portfolio which is the portfolio allocation with the lowest expected volatility. Chart 2b illustrates the asset allocations for the minimum risk portfolios with gold and excluding gold. The optimal portfolio with gold having the lowest estimated volatility allocated 3.5% to gold. The performance of these four portfolios is examined in detail in the next section.

Chart 2a: Optimal portfolios with gold and excluding gold



Source: New Financial Advisors Optimizer, World Gold Council

Chart 2b: Minimum risk portfolios with gold and excluding gold



Source: New Financial Advisors Optimizer, World Gold Council

II: Liquidity buffer portfolio performance

The first section of this analysis determined the optimal allocation to the various LCR assets with and without gold included. An index of the optimal and minimum risk portfolios was constructed by using the optimal allocations calculated in section one and using weekly returns of each asset from January 1994 until December 2011, indexing the beginning value to 100.

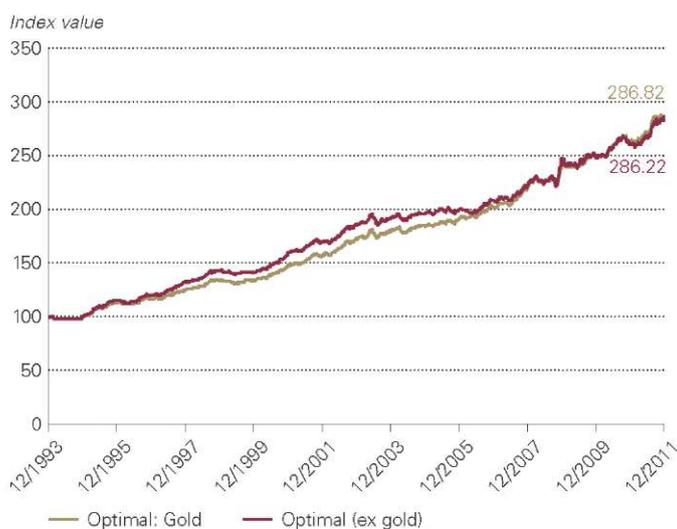
The growth and progression of the liquidity portfolios are shown in Chart 3a and 3b. In both the optimal portfolios and the minimum risk portfolios, the portfolio with gold tracked fairly closely with the portfolios excluding gold, the portfolios with gold surpassed the portfolios (ex gold) in both cases.

More importantly, the summary statistics of these portfolios illustrate that the gold portfolios in both scenarios, exhibited lower annualised volatility (by as much as 38 basis points in optimal scenario) and achieved the same level of return or greater. The result is that an LCR portfolio with gold provides

a higher level of risk-adjusted return for commercial banks as shown with a higher information ratio in both scenarios. Furthermore, the Value-at-Risk (VaR) or maximum loss that could be expected with a 99% confidence level was lower in the portfolios that included gold. This means for a US\$1.0bn liquidity portfolio, a commercial bank could expect to lose a maximum of US\$10.68mn in any given week in an LCR portfolio with gold versus US\$12.92mn in a portfolio excluding gold (Chart 4a and Table 3).

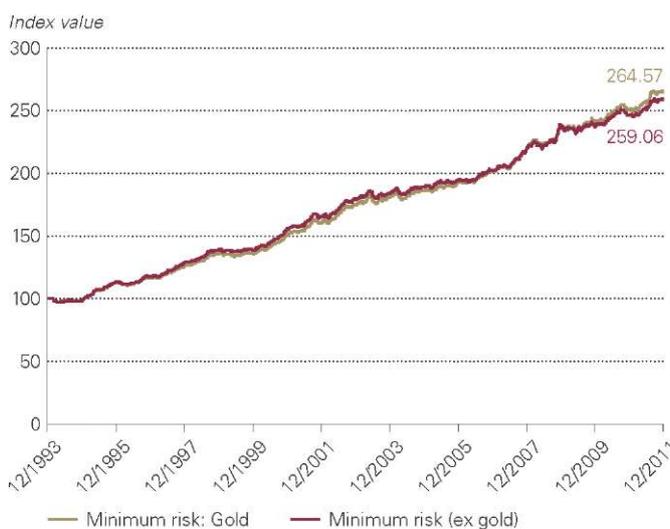
Consistent with the results presented in the efficient frontier in section 1, the summary statistics of a portfolio constructed using historical data (opposed to estimated return and volatility in section 1) reveal that in fact a liquidity portfolio including gold would have reduced volatility, enhanced returns, and minimised losses over the past seventeen years. The next section examines the results of these portfolios during specific key liquidity events.

Chart 3a: Optimal LCR portfolios indexed using historical returns



Source: New Financial Advisors Optimizer, World Gold Council

Chart 3b: Minimum risk LCR portfolios indexed using historical returns

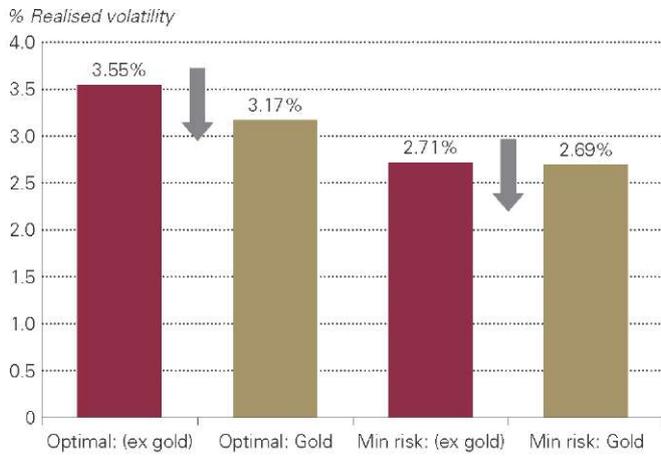


Source: New Financial Advisors Optimizer, World Gold Council

Table 3

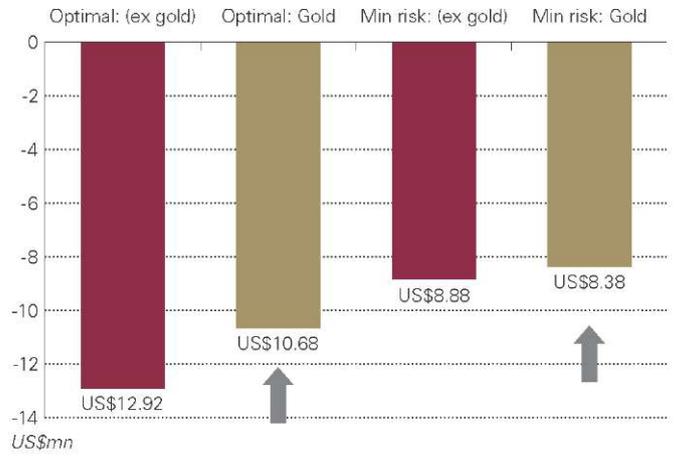
Back-tested performance of liquidity portfolios				
	Optimal: (ex gold)	Optimal: Gold	Minimum risk: (ex gold)	Minimum risk: Gold
Annualised return	5.89%	5.89%	5.31%	5.43%
Annualised volatility	3.55%	3.17%	2.71%	2.69%
Information ratio	1.66	1.86	1.96	2.01
VaR (99%) on US\$1.0bn in millions	US\$12.92	US\$10.68	US\$8.88	US\$8.38

Chart 4a: Optimal and minimum risk portfolios with gold exhibit reduced volatility



Source: Barclays Capital, Bloomberg, World Gold Council

Chart 4b: Maximum loss at the 99% confidence level for a US\$1.0bn liquidity buffer



Source: Barclays Capital, Bloomberg, World Gold Council

III: Analysis of liquidity events

As the policy focus of the LCR is on ensuring banks have adequate liquidity during specific periods of financial strain, in this section the performance of these portfolios during specific short periods of liquidity stress were examined.

Defining periods of liquidity stress

For this analysis a period of liquidity stress is defined as the period when the spread between the London Interbank Offering Rate (LIBOR) and the Overnight Index Swap rate (OIS) in US dollars widened by a rate that was greater than two standard deviations.⁶ The LIBOR-OIS spread is considered a daily measure of the health of the banking system or as Alan Greenspan has termed it “a barometer of fears of bank insolvency.”⁷ While the LIBOR-OIS spread may include some element of credit concern and is not a precise liquidity metric, using LIBOR-OIS allows examination of specific weeks that were under stress while also avoiding using any of the securities analysed in this study such as a credit spreads. Only periods where the spread widened by more than two standard deviations were examined, as for data that is normally distributed, a positive two standard deviation move is likely to occur less than 2.5% of the time. Therefore, the periods of analysis were limited to extreme events, whereby the rate of increase in funding costs accelerated rapidly.

Period of analysis

Five distinct periods were discovered within weekly data between 10 September 2004 to 31 December 2011,⁸ where the LIBOR-OIS spread widened at a pace greater than two standard deviations. The duration of the liquidity stressed period ranged from one week to three weeks as in some cases the LIBOR-OIS spread widened rapidly and then stabilised, while in others the widening accelerated throughout the three weeks.

Results

The analysis of past liquidity stress periods reveals that an optimal liquidity portfolio with gold outperforms an optimal portfolio excluding gold by an average 24 basis points in the past five liquidity stress periods. Furthermore, since gold has no strong correlation with any of the other LCR assets, gold provides true diversification. This is exemplified by the fact that gold’s positive returns during the Lehman Bankruptcy would have outweighed the negative returns to US Agencies and non-financial corporates (existing LCR assets). Thus, during the Lehman bankruptcy, the portfolio with gold outperformed the portfolio (ex gold) by 113 basis points and most importantly increased in value while the portfolio (ex gold) declined (Chart 6a).

As the primary objective of the liquidity buffers is to provide value in these types of critical scenarios, it is fundamental that a liquidity portfolio maintain value exactly when assets tend to become most correlated, i.e. in a crisis. In the two situations where the portfolio (ex gold) outperformed the portfolio with gold, the outperformance was by only 10 basis points, and importantly, the gold portfolio still provided a positive return. Similar results were discovered with the minimum risk portfolios (Chart 6b). A minimum risk portfolio with gold performed positively in each negative scenario, and outperformed the portfolio (ex gold) in four of the five scenarios by on average 12 basis points.

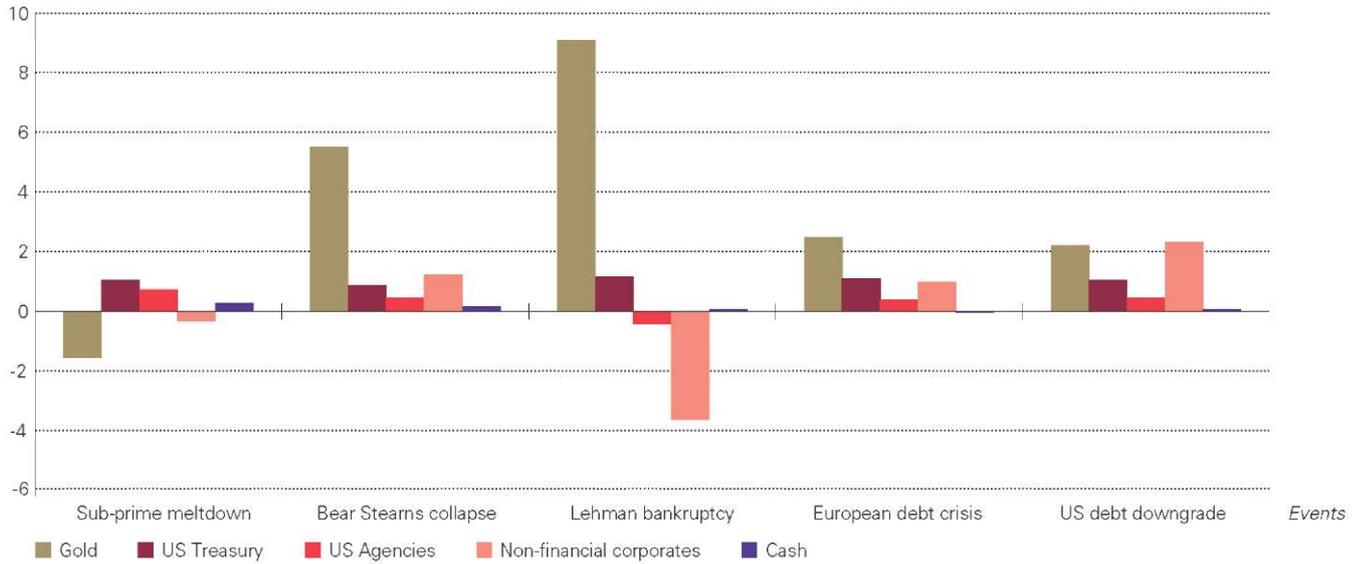
6 For data that is normally distributed, a positive two standard deviation move is likely to occur less than 2.5% of the time. Therefore, these are extreme events also sometimes referred to as tail risks.

7 <http://research.stlouisfed.org/publications/es/09/ES0924.pdf>

8 14 periods were discovered between 7 December 2001 and 31 December 2011 (the period that the LIBOR-OIS spread was available). However, this number was reduced to five periods, as five of the periods were determined to be a consequence of increases in the Fed Funds target rate that took place between 2004 and 2006. Another four periods were excluded as weekly returns day was not available for all securities until 10 September 2004. The Barclays Capital Agencies Aggregate started in September 2004. Note gold had a positive return in all four of the periods that were excluded, thus these results are further support for the primary results.

Chart 5: Performance of LCR assets and gold during liquidity stress periods

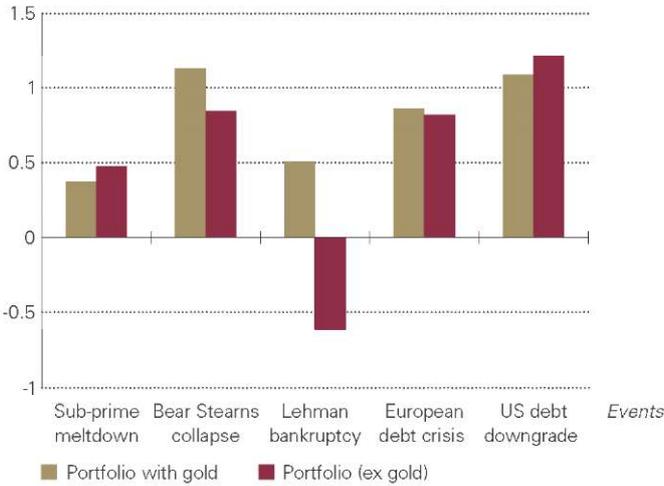
% Return for period



Source: Barclays Capital, Bloomberg, World Gold Council

Chart 6a: Performance of 'Optimal' portfolio with gold against portfolio excluding gold

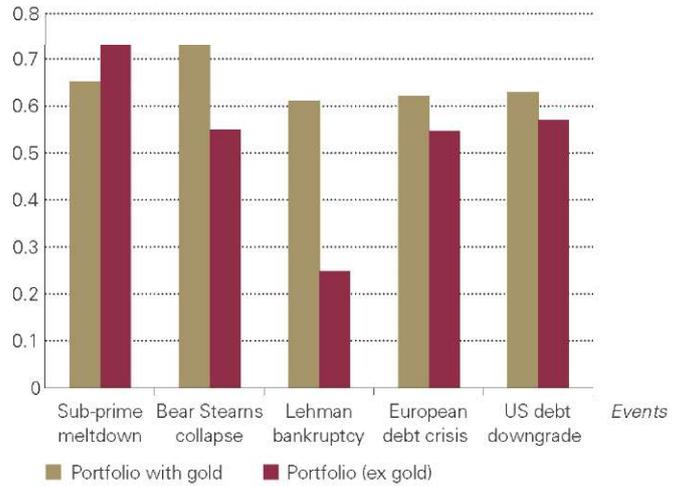
% Return



Source: Barclays Capital, Bloomberg, World Gold Council

Chart 6b: Performance of 'Minimum risk' portfolio with gold against portfolio excluding gold

% Return



Source: Barclays Capital, Bloomberg, World Gold Council

IV: Analysis of bank credit events

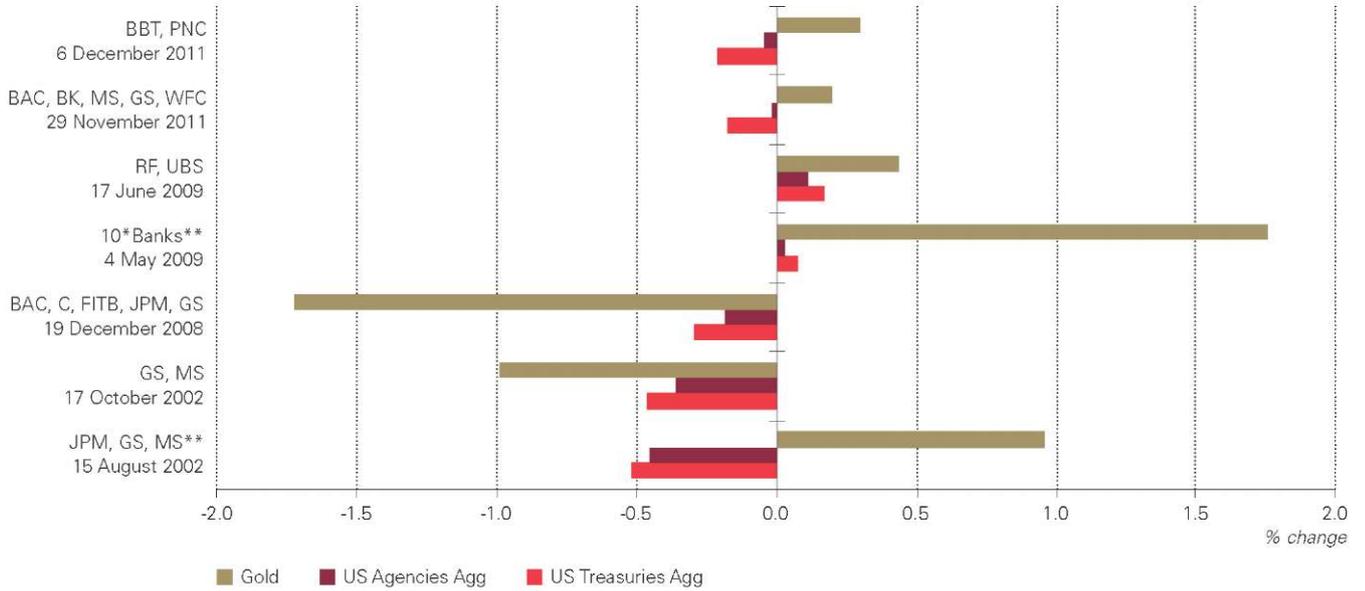
Gold also performs well during bank credit events. In this analysis all credit events for the 19 Bank Holding Companies (BHC) that have been included in the Federal Reserve Board's Comprehensive Capital Analysis and Review (2012) were examined. Specifically, this analysis examines the performance of gold during all Standard and Poor's negative credit events on short term local issuer credit ratings of BHCs. A credit event in this analysis is defined as a one notch (or more) downgrade or the placement of a BHC on negative watch. Coverage of these BHCs initiated as early as 23 November 1981 for J.P. Morgan Chase and varies for each BHC. From all of the data there were 41 distinct days when a bank was downgraded or put on negative watch. Of these 41 days there were 7 days when more than one bank holding company experienced a credit event. During these days when multiple credit events were experienced, gold provided on average a positive 14 basis point return over the trading day. Meanwhile, during these same 7 days, on-the-run US Treasuries and US Agencies on average both declined (Chart 7a). Gold also out performed when assessed over the trading week following the event (Chart 7b).

In addition to examining periods when banks experienced a credit event, the World Gold Council also examined periods when bank equity indices declined at a statistically significant rate. This study examined periods when the Dow Jones US Select Regional Banks Index (DJSRBK) and the exchange traded fund, the Financial Sector SPRDR Fund (XLF) experienced a negative daily return of more than standard deviations.⁹ Of the 148 extremely negative returns on the DJSRBK, the average performance for gold was 22 basis points while the DJSRBK declined on average by 5.2%. During equally extreme events, the XLF ETF declined by on average 6% in a day and gold on average provided a positive 15 basis points return. Against a backdrop of potential banking stress or poor bank earning performance, gold provided stable to slightly increasing value consistent with its role as a capital preservation asset.

⁹ For the DJSRBK index there were 148 occurrences in the 5,846 days examined (30 December 1995 to 31 December 2011) and for the XLF there were 108 occurrences in the 4,755 days examined (25 December 1998 to 31 December 2011).

Chart 7a: Gold, US Treasuries and Agencies performance on day of multiple bank credit events

Credit event

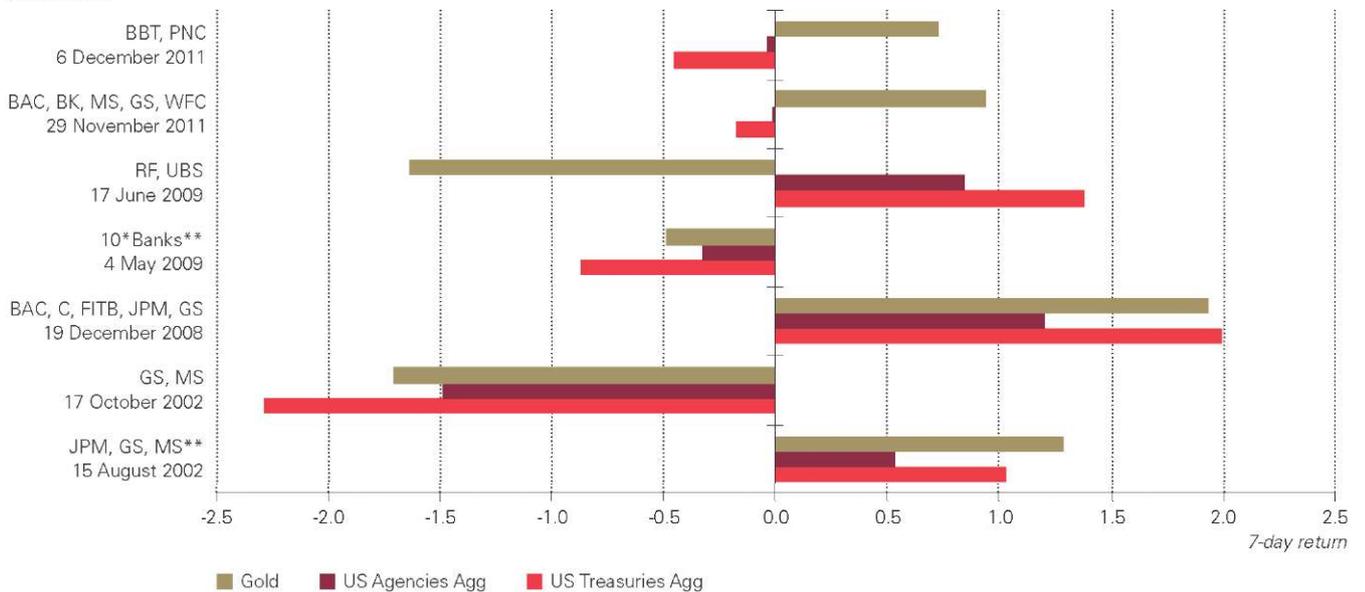


*BAC, BBT, C, FITB, COF, KEY, PNC, RF, USB, WFC
**Negative watch

Source: Barclays Capital, Bloomberg, World Gold Council

Chart 7b: Gold, US Treasuries and Agencies performance from week prior to multiple bank credit events

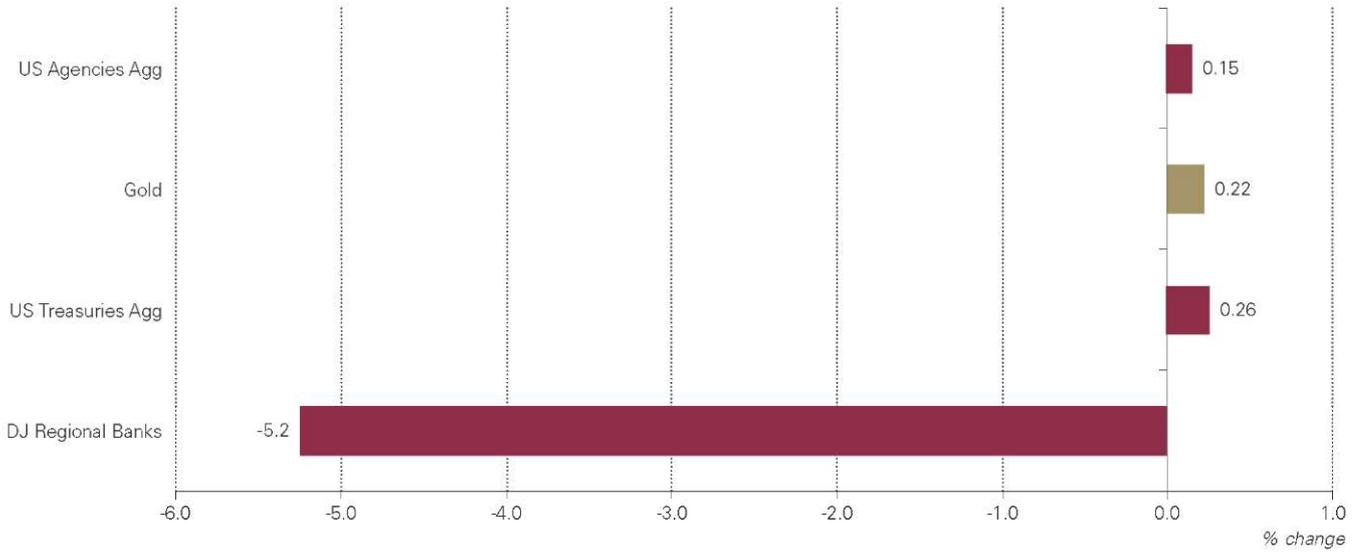
Credit event



*BAC, BBT, C, FITB, COF, KEY, PNC, RF, USB, WFC
**Negative watch

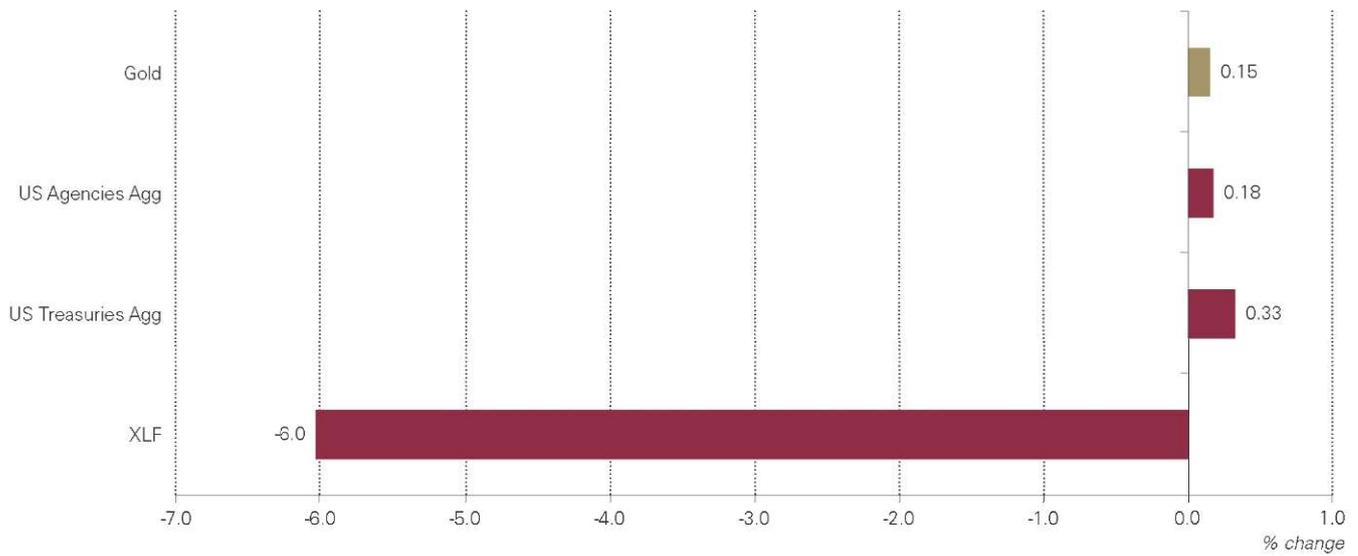
Source: Barclays Capital, Bloomberg, World Gold Council

Chart 8a: Average return of liquid assets when DJ US Select Regional Bank Index is down two standard deviations



Note: Data from 30 December 1994 to 31 December 2011, resulted in 148 occurrences
 Source: Barclays Capital, Bloomberg and World Gold Council

Chart 8b: Average return of liquid assets when XLF ETF is down two standard deviations



Note: Data from 25 December 1998 to 31 December 2011, resulted in 108 occurrences
 Source: Barclays Capital, Bloomberg and World Gold Council

Appendix I

A consistent comparison regardless of the 15% haircut on Level 2 assets

This analysis has examined Level 1 and Level 2 assets without making any regulatory distinction between the two asset categories as the same amount of Level 2 assets were included in each portfolio. The Basel Committee has recommended applying a 15% haircut on all Level 2 assets which would mean that a commercial bank would have to either provide an additional 15% of each Level 2 asset to make up the required LCR or they would have to have an additional 15% in another form of a Level 1 LCR asset. In order to most accurately impose this regulatory haircut on the portfolios that were

presented, a distinction should be made between the extra costs associated with a Level 2 asset versus a Level 1 asset. However, conveniently the optimal portfolio and minimum risk portfolios that included gold and excluded gold maximised Level 2 allocations to the regulatory constraint of 40%. This means that this analysis has provided a consistent comparison of the four portfolios, as they all contain 40% of the liquidity buffer in Level 2 assets. Thus the regulatory cost of holding Level 2 assets, in the form of a haircut, can be assumed to be equally applied across all of the presented portfolios, assuming that a commercial bank has a standard funding cost across level 2 assets (US Agencies, non-financial corporates, and gold).

Appendix II

Table 4: Liquidity stress periods and asset performance

Asset name	Period range		Asset returns					
	Start date	End date	Libor-OIS spread	Gold	US Treasuries	US Agencies	Non-financial corporates	Cash
Sub-prime meltdown	20/07/2007	10/08/2007	422%	-1.55%	1.0%	0.74%	-0.3%	0.28%
Bear Stearns collapse	08/02/2008	29/02/2008	51%	5.55%	0.9%	0.45%	1.3%	0.19%
Lehman bankruptcy	12/09/2008	03/10/2008	234%	9.14%	1.2%	-0.45%	-3.6%	0.06%
European debt crisis	30/04/2010	07/05/2010	59%	2.48%	1.1%	0.39%	1.0%	0.00%
US debt downgrade	29/07/2011	05/08/2011	46%	2.21%	1.1%	0.47%	2.4%	0.00%
Average			162%	3.6%	1.1%	0.3%	0.1%	0.1%

Table 5: Liquidity stress periods and portfolio performance

Asset name	Period range		Portfolio returns					
	Start date	End date	Optimal: (ex gold)	Optimal: Gold	Basis Pts of outperformance	Min risk: (ex gold)	Min risk: Gold	Basis Pts of outperformance
Sub-prime meltdown	20/07/2007	10/08/2007	0.48%	0.37%	(10.49)	0.73%	0.65%	(7.82)
Bear Stearns collapse	08/02/2008	29/02/2008	0.85%	1.14%	28.65	0.55%	0.73%	17.94
Lehman bankruptcy	12/09/2008	03/10/2008	-0.61%	0.52%	112.68	0.25%	0.61%	36.12
European debt crisis	30/04/2010	07/05/2010	0.83%	0.87%	3.79	0.55%	0.62%	7.28
US debt downgrade	29/07/2011	05/08/2011	1.22%	1.09%	(12.83)	0.57%	0.63%	6.08
Average			0.55%	0.80%	24	0.53%	0.65%	12

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